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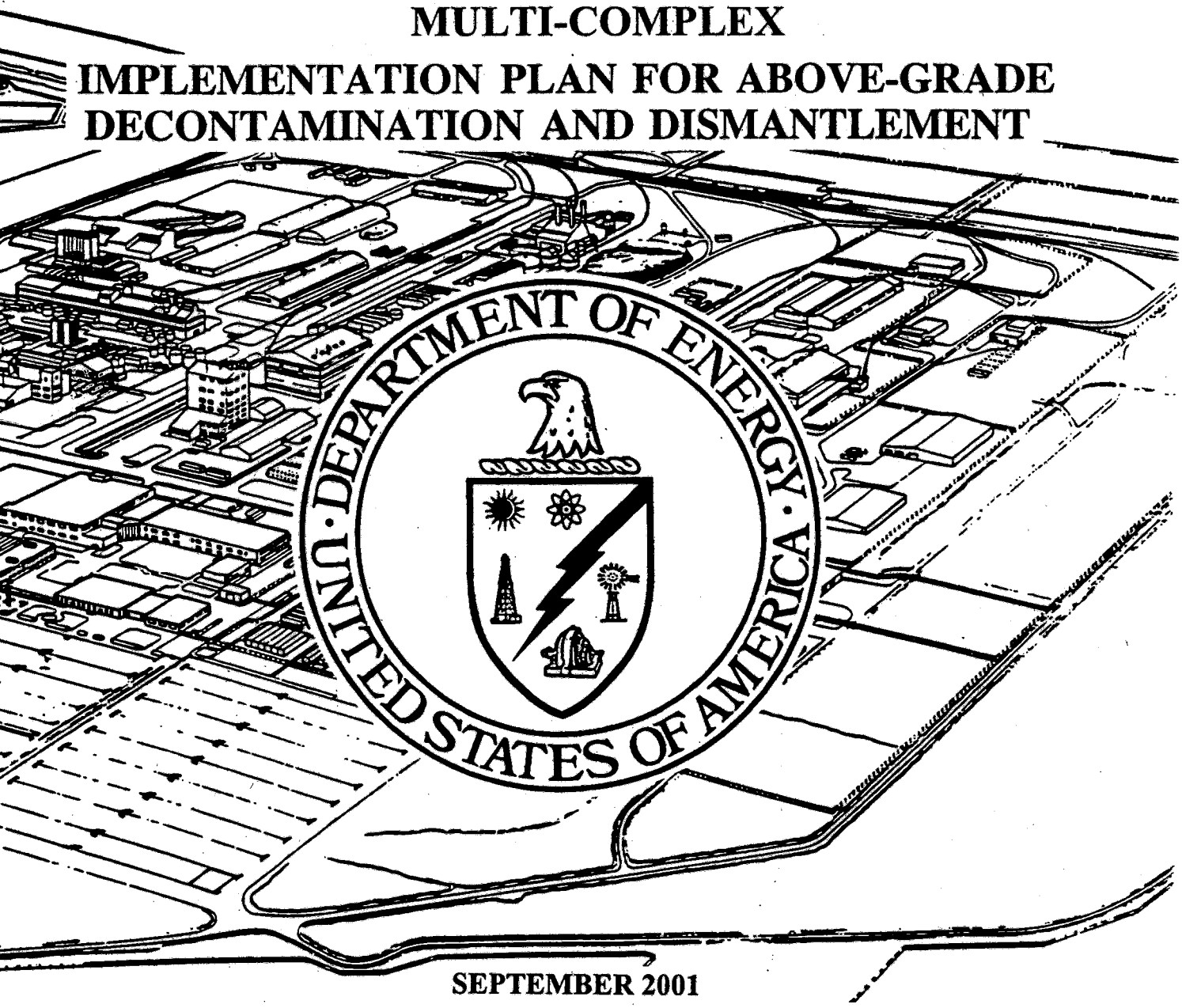
OPERABLE UNIT 3

MULTI-COMPLEX IMPLEMENTATION PLAN FOR ABOVE-GRADE DECONTAMINATION AND DISMANTLEMENT



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FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

FINAL

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MULTI-COMPLEX IMPLEMENTATION PLAN FOR ABOVE-GRADE DECONTAMINATION AND DISMANTLEMENT

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NOTATION

Abbreviations, Acronyms, and Initials

ACM	asbestos-containing material(s)
AMS	air monitoring station
ARP	Aquifer Restoration Project
AWWT	Advanced Waste Water Treatment System
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act, as amended
CMU	concrete masonry unit
DOE	United States Department of Energy
D&D	decontamination and dismantlement
FEMP	Fernald Environmental Management Project
HEPA	high-efficiency particulate air [filter]
HVAC	heating, ventilating, and air conditioning
IEMP	Integrated Environmental Monitoring Plan
IIMS	Integrated Information Management System
MEF	Material Evaluation Form
MSCC	Material Segregation and Containerization Criteria
NESHAPs	National Emissions Standards for Hazardous Air Pollutants
NPDES	National Pollutant Discharge Elimination System
NTP	Notice to Proceed
NTS	Nevada Test Site
Ohio EPA	Ohio Environmental Protection Agency
OU3	Operable Unit 3
PCB(s)	polychlorinated biphenyl(s)
PCDF	permitted commercial disposal facility
PPE	personal protective equipment
PWID	Project Waste Identification and Disposition [form]
RCRA	Resource Conservation and Recovery Act, as amended
RD/RA	remedial design/remedial action
RI/FS	remedial investigation/feasibility study
ROB	roll-off box
ROD	Record of Decision

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Abbreviations, Acronyms, and Initials (Cont'd.)

SAP	Sampling and Analysis Plan
SWIFTS	Site-Wide Waste Information, Forecasting and Tracking System
U.S. EPA	United States Environmental Protection Agency
WAC	Waste Acceptance Criteria
WWTS	waste water treatment system

Units of Measure

cm.	centimeter(s)
cm^2	square centimeter(s)
dpm	disintegration(s) per minute
ft.	foot (feet)
ft^2	square foot (feet)
ft^3	cubic foot (feet)

Chemical Symbols

U	uranium
U-235	uranium-235

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1.0 INTRODUCTION

1.1 Project Statement

This implementation plan represents the sole remedial design deliverable developed for the Multi-Complex decontamination and dismantlement (D&D) project, which has been prepared for regulatory agency approval pursuant to the Operable Unit 3 (OU3) Integrated Remedial Design/Remedial Action (RD/RA) Work Plan (DOE 1997a). This document presents a summary of the remedial design documentation prepared for the D&D of all components included in the Multi-Complex D&D project. This D&D project is being implemented pursuant to the authority stipulated in the OU3 Record of Decision for Final Remedial Action (OU3 Final ROD) (DOE 1996), which covers D&D, waste treatment, and disposition.

The Multi-Complex D&D project combines five D&D complexes that were originally identified in the OU3 Integrated RD/RA Work Plan – Plant 2 Complex, Plant 3 Complex, Plant 8 Complex, General Sump Complex, and Liquid Storage Complex – into one project. The combination of the five complexes into one project allows for significant savings in both time and cost for design/planning and implementation. This implementation plan serves as the sole design deliverable for all five complexes and satisfies the regulatory submittal requirements for each complex as defined in Table 6-1 of the OU3 Integrated RD/RA Work Plan.

The purpose of this document is to summarize the Multi-Complex D&D project design in the format and content outlined in the OU3 Integrated RD/RA Work Plan and established by previously approved D&D implementation plans. This document elaborates, as applicable, on programmatic strategies developed for the Contractor's scope of work, and project specifications contained in Appendix C of this document.

1.2 Scope of Work

The Multi-Complex D&D project includes the following major activities:

- hazardous waste management unit closure;
- asbestos abatement/removal;
- surface decontamination;

- above-grade component dismantlement;
- environmental monitoring; and
- material management.

Inventory Removal and Facility/Safe Shutdown are preparatory actions that are not in the scope of this D&D project but pertinent information from those activities has been summarized in Sections 2 and 3. The following components are included in the Multi-Complex D&D project:

- Building 2A – Ore Refinery Plant
- Building 2B – General/Refinery Sump Control Building;
- Building 2C – Bulk Lime Handling Building;
- Building 2D – Metal Dissolver Building;
- Component 2F – Cold Side Ore Conveyor;
- Component 2H – Conveyor Tunnel (From Plant 1)
- Building 3A – Maintenance Building;
- Building 3B – Ozone Building
- Building 3C – NAR Control House
- Component 3D – NAR Towers;
- Building 3E – Hot Raffinate Building;
- Component 3H – Refinery Sump;
- Component 3J – Combined Raffinate Tanks;
- Component 3K – Old Cooling Water Tower;
- Building 3L – Electrical Power Center Building;
- Building 8A – Recovery Plant;
- Building 8B – Plant 8 Maintenance Building;
- Building 8C – Rotary Kiln/Drum Reconditioning;
- Building 8D – Plant 8 Railroad Filter Building;
- Building 8E – Drum Conveyor Shelter;
- Building 8G – Trash Compactor Building;
- Building 8H – Soil Washing Building;
- Component 18B – General Sump;
- Building 18D – Biodenitrification Towers;
- Building 18H – BDN Effluent Treatment Facility;

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- Component 18J – Methanol Tank;
- Building 20E – Well House #1;
- Building 20F – Well House #2;
- Building 20G – Well House #3;
- Building 22B – Storm Sewer Lift Station;
- Building 22D – Scale House & Weigh Scale;
- Component 22E – Utility Trench to Pit Area
- Building 26A – Pump House – HP Fire Protection;
- Component 26B – Elevated Water Storage Tank;
- Building 28D – Guard Post Adjacent to 74Q (formerly from West End of 2nd St.);
- Building 39A – Incinerator Building;
- Building 45A – Maintenance Machine Shop Building;
- Building 80 – Plant 8 Warehouse; and
- Component G-008 – Pipe Bridges.

Nine components that had been originally included in the five D&D Complexes that make up the Multi-Complex D&D project were dismantled under the Miscellaneous Small Structures. These include Components 2E (NFS Storage and Pump House), 2G (Hot Side Ore Conveyor), 3F (Harshaw System), 3G (Refrigeration Building), 8F (Plant 8 Old Drum Washer), 22A (Gas Meter Building), 39B (Waste Oil Decant Shelter), 39C (Incinerator Sprinkler Riser House) and 45B (Utility Shed East of Rust Trailers). Additionally, three HWMUs which had been originally included in some of the listed components were closed through either an accelerated RCRA/CERCLA Integrated Closure process or through the MSS D&D project. The three HWMUs include HWMU No. 28 (Trane Incinerator), HWMU No. 50 (UNH Tanks – Hot Raffinate Building) and HWMU No. 46 (UNH Tanks – NFS Storage Area).

The requirements for remediation of components in the Multi-Complex D&D project were developed using the performance specifications that were originally included in Appendix B of the OU3 Integrated RD/RA Work Plan. Appendix C of this Implementation Plan contains project-specific applications of these performance specifications that incorporate process improvements and lessons-learned from previous D&D projects at the FEMP.

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DOE will provide notification to the regulatory agencies of any significant changes to the design prior to implementation. Should the regulatory agencies have any concerns regarding any significant design change, DOE will properly address those concerns as soon as practicable and, if necessary, perform one or more of the following: amend the implementation plan, amend the OU3 Integrated RD/RA Work Plan, present an explanation of significant difference to the OU3 ROD, and/or amend the RODs. Significant changes to the design are those that require formal design modification that would impact the implementation strategies presented in this document. If necessary, affected activities may be suspended until the revision has been completed and approved. This course of action adheres to the commitments made in Section 4.2.2 of the OU3 Integrated RD/RA Work Plan for design changes.

1.3 Plan Organization

This implementation plan is comprised of five sections and five appendices. Section 1 contains the remedial action project statement, scope of work, an overview of this implementation plan, and a brief description of the Multi-Complex D&D project components. Section 2 describes the overall approach to implementing this above-grade D&D project, as applied from the OU3 Integrated RD/RA Work Plan. That approach includes the projected sequence for remediation of components, a plan for materials management, environmental monitoring activities, and the project-specific applications of implementation strategies for above-grade remediation. Section 3 presents pertinent component history and applicable component-specific details of the applicable remedial tasks. Section 4 presents the schedule for remediation and project reporting. Section 5 describes the subcontract strategy and FEMP project management approach.

Appendix A contains a discussion of potential environmental and occupational sampling for this project, based on the assumptions in the Sampling and Analysis Plan (SAP) contained in Appendix D of the OU3 Integrated RD/RA Work Plan, and on the remediation requirements presented in this plan. Appendix B provides a summary of the evaluation of material disposition alternatives for accessible metals and a tabulation of the cost comparison between the disposition alternatives. Appendix C provides the project performance specifications. Appendix D provides copies of available drawings, which show floor plans and elevations of

components. Appendix E contains selected photographs of notable features of the Multi-Complex D&D project components.

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1.4 Location of the Multi-Complex D&D Project Area

The Multi-Complex D&D project site is located at the U.S. Department of Energy (DOE) Fernald Environmental Management Project (FEMP) in Fernald, Ohio. Project components include essentially all of the structures between "B" Street and the west boundary of the former Production Area, and between 1st Street and 2nd Street; however, three structures – Components 18J, 20G and 22B reside outside of this footprint but are within 400 feet from the main project area. The Multi-Complex D&D project area is illustrated in Figure 1-1.

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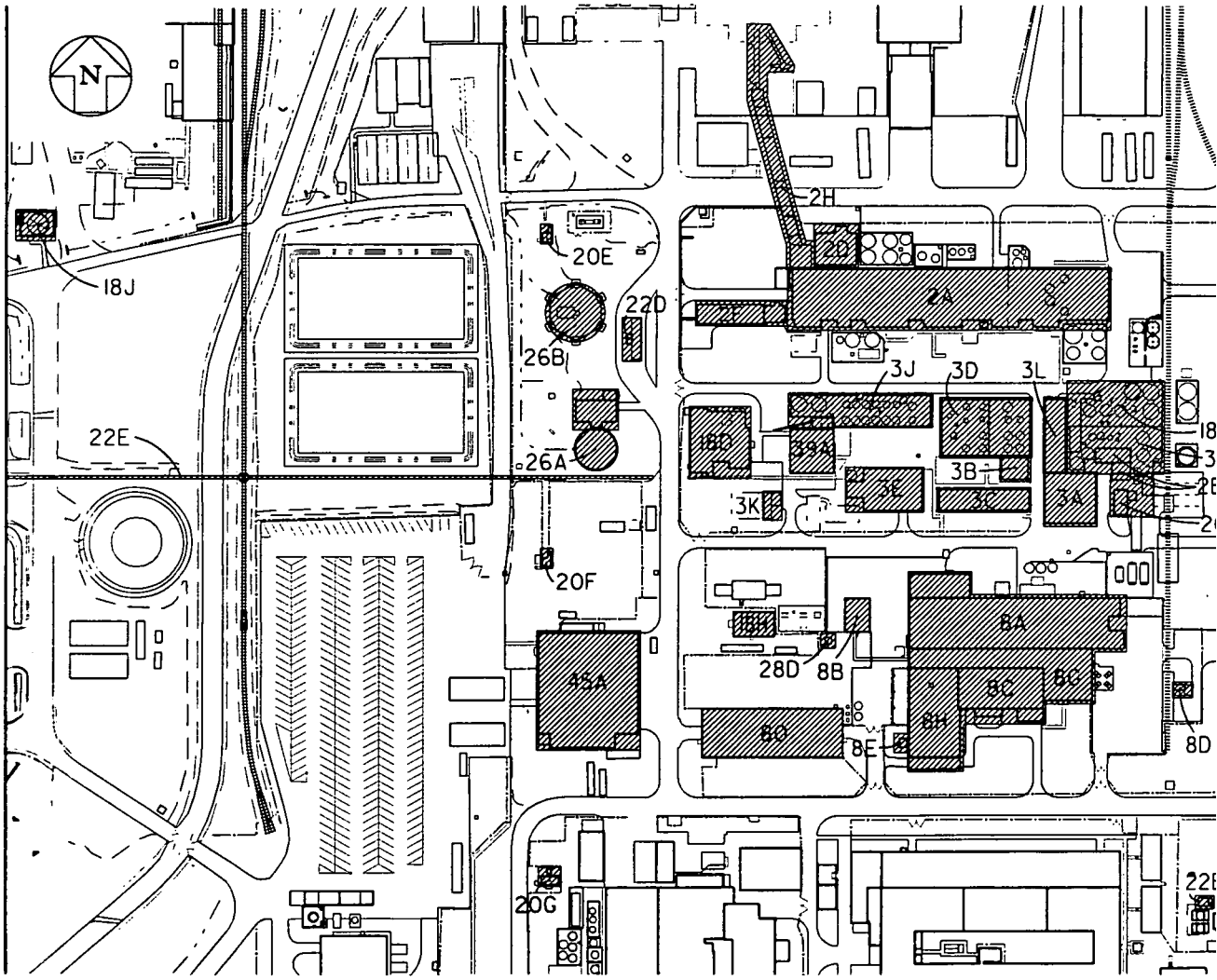

FIGURE 1-1 Multi-Complex D&D Project

2.0 GENERAL PROJECT REMEDIATION APPROACH

The general approach for above-grade D&D of the Multi-Complex D&D project is based project-specific applications of the programmatic strategies that were described in Section 3 of the OU3 Integrated RD/RA Work Plan. Section 2 of the implementation plan summarizes the project-specific applications of those strategies.

2.1 Sequencing of Remediation

The remediation project as a whole includes the following stages: 1) Notice to Proceed (NTP); 2) Premobilization, when Contractor Safe Work Plans are prepared and approved; 3) Mobilization, which includes establishing project support facilities and controls; and 4) D&D field activities for each component. The actual sequence for D&D of buildings/structures will be determined by the Contractor's project schedule, subject to FEMP Project Management approval. There are several components that will not be available for dismantlement until the later months of the project schedule. The components that have constraints on D&D are the following:

- Building 3A – Maintenance Building;
- Building 3L – Electrical Power Center Building;
- Building 45A – Maintenance Machine Shop Building;
- Building 80 – Plant 8 Warehouse; and
- Component G-008 – Pipe Bridges (specifically those portions with active utilities).

Building 3A is proposed to be utilized as a Radiological Control/Change Facility as Multi-Complex D&D project components are removed, whereupon it would be dismantled using a small workforce and portable/mobile support facilities. Building 3L serves as a secondary unit substation that receives 13.2 kV and transforms it down to 480 V to power facilities and equipment in the area and west of the former Production Area. Because of its continued service to outlying areas, Building 3L will serve as the power supply for Multi-Complex D&D project work until an alternate power supply for the outlying areas is made available. Building 45A was converted in 1998 from Construction Division offices to the site Maintenance Machine Shop due to dismantlement of Building 12A. Use of Building 45A for site maintenance machine work is expected to continue through July 2004 and undergo facility

shutdown in August-September 2004. This schedule will allow the building to be made available for D&D in October 2004. Building 80, which houses HWMU No. 29, will be used for repackaging of nuclear metals until December 2004 when disposition of those wastes should be completed. This will allow the building to be made available for D & D in March 2005 after completion of facility shutdown in January-February 2005. Dismantlement of some portions of Component G-008 (Pipe Bridges) will be constrained by the need to use several segments for continued utilities supply to the Plant 1 Pad and users west of the former Production Area.

Due to the large number of components included in this D&D project and the fact that the D&D contractor will propose a D&D sequence, subject to FEMP D&D Project Management approval, the following sequence is one logical general approach.

2.2 Characterization of the Multi-Complex D&D Project

Historical and recent radiological surveys were compiled during the design. The expected radiological conditions are summarized in Table 2-1.

TABLE 2-1 RADIOLOGICAL CONTAMINATION SURVEY SUMMARY

Component	Number of Data Points	Removable Range (Average) Readings are beta-gamma unless otherwise noted	Fixed Plus Removable Range (Average) Readings are beta-gamma unless otherwise noted
Plant 2 Complex			
2A Digestion Area	67	<MDCR - 40K (2K)	30K - 3M (286K)
2A Extraction Area (Th)	70	alpha <MDCR - 10K (2K) beta-gamma <MDCR - 12K (2K)	N/A 30K - 6M (570K)
2A Denitration Area	51	<MDCR - 8K (2.2K)	30K - 1.2M (306K)
2D Metal Dissolver Bldg.	15	<MDCR - 800 (600)	<MDCR - 1.2M (362K)
Plant 3 Complex			
3D NAR Towers	40	<MDCR - 1.3K (1K)	<MDCR - 330K (64K)
3E Hot Raffinate Bldg.	51	<MDCR - 4.8K (1.5K)	30K - 1.5M (317K)
3J Combined Raff. Tanks	50	<MDCR - 40K (6.8K)	<MDCR - 1.8M (347K)
39A Incinerator Bldg.	29	<MDCR - 20K (4.2K)	<MDCR - 300K (108K)
Plant 8 Complex			
8A Recovery Plant, Th Area	150	alpha 19 - 2917 (411) beta - gamma 12 - 80K (2.8K)	N/A 12K - 3M (363K)
8A Recovery Plant, U Area	94	<MDCR - 120K (2.7K)	3K - 3M (282K)
8B Maintenance Bldg.		<MDCR	<MDCR - 210K (31K)
8C Rotary Kiln/Drum Recon.	55	<MDCR - 15K (1200)	<MDCR - 150K (6K)
8D Railroad Filter Bldg.	2	800	210K - 270K (240K)
8G SE Annex	33	1K - 40K (8.8K)	45K - 4.8M (1.2M)
8H Soil Washing	40	<MDCR	<MDCR - 9K (5.2K)
General Sump Complex			
2B Control Building	64	<MDCR - 9K (1K)	<MDCR - 450K (30K)
2C Bulk Lime Handling Bldg.	32	<MDCR - 600 (200)	<MDCR - 12K (9K)
3A Maintenance Building	Facility still in use	N/A	N/A
3H Refinery Sump	26	<MDCR - 20K (3K)	6K - 900K (80K)
3L Electrical Power Center	Facility still in use	N/A	N/A
18B General Sump	33	<MDCR - 15K (1K)	3K - 1.5M (72K)
18D Biodenitrification Twrs.	35	<MDCR - 6K (417)	<MDCR - 12K (<3K)
18H BDN Effluent Trtmnt.	25	<MDCR	<MDCR - 240K (24K)

Relevant analytical evaluation data generated from the OU3 Remedial Investigation/Feasibility Study (RI/FS), which was summarized in Section 3.3.1 of the OU3 Integrated RD/RA Work Plan, revealed the following information:

- Acid brick considered potentially mixed waste is present in Buildings 2A (Denitration Area – 42 tons), 2D (West Metal Dissolver Area – 10 tons), and 2D (Charcoal Treatment Area – 10 tons). This particular debris will be handled as potentially mixed waste for treatment and disposition.
- Lead flashing considered potentially mixed waste is present in Buildings 2A (3.99 tons), 2B (0.1 ton), 8A (1.35 tons), 20E (0.01 ton), 20F (0.01 ton), and 20G (0.01 ton).
- Surface concrete (top inch) that remains on the floor of the Muffle Furnace Area of Building 8A contains elevated concentrations of technetium-99 (Tc-99) must be containerized for off-site disposal. An estimated 9 percent of original surface concrete from the first floor remains in inaccessible areas following the Surface Concrete Removal Demonstration conducted in 1998 (DOE 1998). The entire top-inch of surficial concrete from the second floor of the Muffle Furnace Area requires removal and off-site disposition.

Additionally, the OU3 RI/FS and Safe Shutdown Turnover documents identified various equipment/systems in former process facilities that may contain residual uranium compounds. Such equipment/systems will have to be cleaned of all process residues if the resultant debris is to be disposed of in the On-Site Disposal Facility (OSDF). The affected components include 2A, 2D, 3D, 3E, 8A, 8C, 18D, 18H, and 39A. Other materials to be generated from components in the Multi-Complex D&D project are considered low-level radiological waste, which may be disposed in the OSDF provided that other physical OSDF Waste Acceptance Criteria (WAC) are met.

The most significant concerns arising from the review of component characterization data are the health and safety of the workers during dismantlement of equipment/systems and personnel who will handle OSDF-bound debris during placement. Whereas most debris is going to have fixed low-level uranium contamination, a significant volume of debris will have thorium contamination also. Areas that are known to contain thorium-230 contamination include the east central portion of Building 8A, the Extraction Area of Building 2A, building 3E and Building 39A. Debris generation from these areas will have to conform to radiological limitations for thorium-230 to ensure minimal exposures to workers placing the debris in the OSDF. The presence of loose, unfixed radiological contamination justifies at least best available technology to prevent or minimize generation of airborne dusts. This condition requires thorough surface

cleaning of each piece of debris prior to containerizing to remove any loose contamination. Best available technology also requires the use of extra high efficiency particulate air (HEPA) filtration ventilation devices and vacuums.

Specific uses of the radiological conditions summarized in Table 2-1 during the remedial design includes support for the following design efforts:

- develop the safety assessment documentation to support the proposed activities;
- enhance the project-specific health and safety requirements and determine potential concerns for worker protection based on the suggested D&D techniques;
- document expected contamination levels for the Contractor;
- determine personnel monitoring requirements;
- air modeling and assessment of potential radiological air emissions; and,
- identify potential gross radiological contamination that will need to be removed/fixed prior to exposing affected material surfaces to the environment.

The Multi-Complex D&D project was evaluated by a State of Ohio-Certified Asbestos Hazard Evaluation Specialist for asbestos containing materials (ACM). The results of this evaluation are summarized in Table 2-2.

Table 2-2 Multi-Complex D&D Project Asbestos Summary

Building	Asbestos Material	Location	Asbestos Content
2A	Pipe Insulation	Throughout building	1-50% Chrysotile 5-60% Amosite
2A	Pipe Fitting Insulation	Throughout building	1-70% Chrysotile 10-40% Amosite
2A	Tank Insulation	Throughout building	10-40% Chrysotile 5-20% Amosite
2A	HVAC Duct Insulation	Denitration area	30% Chrysotile
2A	HVAC Expansion/Vibration Joints	Throughout building	Assume ACM
2A	Transite	Exterior walls and roof	30% Chrysotile
2A	Transite	Interior walls and roof	30% Chrysotile
2A	Transite (deteriorated)	Interior walls and roof in Digestion and Extraction areas	30% Chrysotile
2A	Transite/Aircell Composite Wallboard	Firewalls at Col. 8 and Col. 14	20-50% Chrysotile 20% Amosite
2A	Transite	Inside electrical breaker panels in each control center/substation	20-30% Chrysotile
2A	Floor Tile	Offices, control room and break areas	Assume ACM
2A	Floor Tile Mastic	Offices, control room and break areas	Assume ACM
2A	Built-Up Roofing	Extraction area	1-3% Chrysotile
2A	Fire Rated Doors	Throughout building	Assume ACM
2A	Gutter Debris	Building gutters	>1% Chrysotile
2B	Pipe Insulation	Throughout building	1-20% Chry 20% Amo
2B	Pipe Fitting Insulation	Throughout building	15% Chrysotile
2B	Transite	Exterior walls and roof	
2B	Transite	Interior walls and roof	15% Chrysotile 25% Amosite
2B	Transite	Lab bench top	20-30% Chrysotile
2B	Gutter Debris	Building gutters	>1% Chrysotile
2B	Tank insulation (Tank F3A-3)	Outside, southeast corner of building	20-30% Chrysotile
2C	Pipe Insulation	Throughout building	3-6% Chrysotile
2C	Pipe Fitting Insulation	Throughout building	3-6% Chrysotile
2C	Transite	Exterior walls and roof	20-30% Chrysotile
2C	Gutter Debris	Building gutters	>1% Chrysotile
2D	Pipe Insulation	Throughout building	15-50% Chrysotile 20-70% Amosite
2D	Pipe Fitting Insulation	Throughout building	1-15% Chrysotile
2D	Transite	Exterior walls and roof	20-30% Chrysotile
2D	Transite	Interior walls and roof	20-30% Chrysotile
2D	Transite (deteriorated)	Localized interior and exterior locations	20-30% Chrysotile
2D	Gutter Debris	Building gutters	>1% Chrysotile
3A	Floor Tile	Office areas	5% Chrysotile
3A	Floor Tile Mastic	Office areas	10-15% Chrysotile
3A	Transite	Exterior walls and roof	20-30% Chrysotile
3A	Transite	Interior walls and roof	20-30% Chrysotile
3A	Gutter Debris	Building gutters	>1% Chrysotile
3B	Transite	Exterior walls and roof	30% Chrysotile
3B	Gutter Debris	Building gutters	>1% Chrysotile
3C	Pipe Insulation	Throughout building	5-20% Chrysotile 15-25% Amosite
3C	Pipe Fitting Insulation	Throughout building	35-50% Chrysotile 10% Amosite
3C	Transite	Exterior walls and roof	30% Chrysotile
3C	Transite	Interior walls and roof	30% Chrysotile

3C	Floor Tile	Throughout building	5-20% Chrysotile
3C	Floor Tile Mastic	Throughout building	5-20% Chrysotile
3C	Gutter Debris	Building gutters	>1% Chrysotile
3D	No asbestos materials found		
3E	Transite	Exterior walls and roof	30% Chrysotile
3E	Transite	Interior walls and roof	30% Chrysotile
3E	Transite (deteriorated)	Interior walls and roof between col. 5 and 6	30% Chrysotile
3E	Gutter Debris	Building gutters	>1% Chrysotile
3J			
3K	Tank Insulation	Exterior on pad	25% Chry Trace Amo
3L	Pipe Insulation	Throughout building	5-25% Chrysotile 10-25% Amosite 10% Crocidolite
3L	Pipe Fitting Insulation	Throughout building	5-60% Chrysotile
3L	Transite	Exterior walls and roof	20-30% Chrysotile
3L	Transite	Interior walls and roof	20-30% Chrysotile
3L	Transite	Inside electrical breaker panels in substation	20-30% Chrysotile
3L	Gutter Debris	Building gutters	>1% Chrysotile
8A	Pipe Insulation	Throughout building	1-40% Chrysotile 15-40% Amosite
8A	Pipe Fitting Insulation	Throughout building	5-70% Chrysotile 5-15% Amosite
8A	Tank Insulation (NaOH Tanks)	Outside, NE of Plant 8	20-30% Chrysotile
8A	Equipment Insulation	Cyclone on roof	Assume ACM
8A	Floor Tile	Offices and break rooms	5% Chrysotile
8A	Floor Tile Mastic	Offices and break rooms	5% Chrysotile
8A	Transite	Exterior walls and roof	20-30% Chrysotile
8A	Transite	Interior walls and roof	20-30% Chrysotile
8A	Transite	Inside electrical breaker panels in the substation	20-30% Chrysotile
8A	Fire Rated Doors	Throughout building	Assume ACM
8A	Gutter Debris	Building gutters	>1% Chrysotile
8B	Pipe Insulation	Throughout building	10% Chry 35-40% Amo
8B	Pipe Fitting Insulation	Throughout building	40-60% Chrysotile
8B	Floor Tile	Office/break area	Assumed ACM
8B	Floor Tile Mastic	Office/break area	Assumed ACM
8C	No Asbestos Materials Found		
18B	Pipe Insulation	Throughout facility	Assume ACM
18B	Pipe Fitting Insulation	Throughout facility	Assume ACM
18D	Floor Tile	Offices and laboratory area	Assume ACM
18H	No Asbestos Materials Found		
18J	No Asbestos Materials Found		
20E	Pipe Insulation	Throughout building	50% Chrysotile
20E	Pipe Fitting Insulation	Throughout building	25-30% Chrysotile
20E	Built-Up/Asphalt Roofing	High and low roof areas	5% Chrysotile
20F	Pipe Insulation	Throughout building	2-60% Chrysotile
20F	Pipe Fitting Insulation	Throughout building	2-60% Chrysotile
20F	Built-Up/Asphalt Roofing	High and low roof areas	5% Chrysotile
20G	Pipe Insulation	Throughout building	10% Chrysotile
20G	Pipe Fitting Insulation	Throughout building	10% Chrysotile
20G	Roofing Tar	High and low roof areas	5% Chrysotile
22B	Pipe Insulation	Throughout building	Assume ACM
22B	Pipe Fitting Insulation	Throughout building	Assume ACM
22B	Built-Up Roofing	Entire building	Assume ACM
22D	Transite	Exterior walls and roof	20-30% Chrysotile
26A	No Asbestos Materials Found		
26B	No Asbestos Materials Found		

39A	Transite	Exterior walls and roof	25% Chrysotile
39A	Gutter Debris	Building gutters	>1% Chrysotile
45A	Pipe Insulation	Throughout building	10-50% Chrysotile 5-40% Amosite
45A	Pipe Fitting Insulation	Throughout building	10-50% Chrysotile 25-30% Amosite
45A	Floor Tile	Throughout building	ACM contaminated
45A	Floor Tile Mastic	Throughout building	15-25% Chrysotile
45A	Transite	Interior walls, south open area	20-30% Chrysotile
45A	Transite	Inside electrical breaker panels in southeast substation	20-30% Chrysotile
80	No Asbestos Materials Found		
G-008	Pipe Insulation	Throughout site	Assume ACM
G-008	Pipe Fitting Insulation	Throughout site	Assume ACM

2.3 Materials Management

Project-specific material management strategies for the Multi-Complex D&D project are based on the overall material management strategies that were presented in Section 3.3 of the OU3 Integrated RD/RA Work Plan and the project-specific requirements presented in Specification Section 01120. Management of primary and secondary waste materials estimated to be generated during the Multi-Complex D&D project is discussed in this section.

Waste minimization will be accomplished, in part, by ensuring that equipment and material are unpacked prior to entering the FEMP controlled area whenever possible. This administrative control will limit the amount of trash that could become contaminated and limit quantities of any hazardous material brought into the project area.

2.3.1 Primary Materials Management

Primary materials refer to the debris that will be generated by the dismantlement of the components and structures in the Multi-Complex D&D project. During the remedial design, a Project Waste Identification and Disposition form (PWID — see Section 3.3.1 of the OU3 Integrated RD/RA Work Plan for description) was developed which identifies all debris to be generated, quantities, characterization, container requirements, and disposition location. In support of the PWID, each waste stream has been characterized and documented in a Material Evaluation Form (MEF). To supply the Contractor with the sizing, segregation, and containerization requirements outlined in the OU3 Integrated RD/RA Work Plan, a Material

Segregation and Containerization Criteria form (MSCC — see Section 3.3.1 and Appendix A of the work plan for description and example, respectively) was developed.

Pursuant to DOE's commitment to evaluating potential opportunities for recycle/reuse, as described in Section 3.3.6.1 of the OU3 Integrated RD/RA Work Plan, an evaluation of material disposition alternatives for accessible metals was performed and a summary of the results is presented in Appendix B.

Specification Section 01120 identifies debris/waste-handling requirements for the Contractor. Debris handling requirements are defined by the following classifications: 1) non-process debris; 2) process debris; and 3) suspect process debris. Details regarding the handling of each of these types of debris are described in Article 3.2 of Specification Section 01120. All debris is required to be sized, segregated, and containerized in accordance with MSCC. To ensure that debris, which is destined for disposal in the OSDF, meets the OSDF waste acceptance criteria (WAC), the MSCC identifies specific materials from the project that are known to either meet or not meet the OSDF WAC. When debris are generated, a representative from the OSDF Waste Acceptance Organization will ensure that debris is segregated according to the proper debris categories identified on the MSCC, with specific oversight on the debris being containerized for the OSDF.

One particular inspection that Waste Acceptance Organization (WAO) representatives will provide during debris generation is whether or not certain debris contains visible process residues. The definition of visible process residues (green salt, yellow cake, black oxide, etc.) is hold-up/materials on the interior or exterior surfaces of debris that is obvious and that if rubbed, would be easily removed. Dirt, oil, grease, stains, rust, corrosion, and flaking do NOT qualify as visible process residues; however, dirt, oil, grease, stains, rust, corrosion, and flaking require decontamination (i.e., surface cleaning) for radiological control purposes prior to removing the debris from the enclosure or prior to opening a building to the environment per Specification Section 01517. The evaluation to determine whether or not something is "process debris" will occur both before and during debris generation. Process-related piping and equipment will be evaluated during dismantlement as to whether removal of visible process residues is practical. Regardless of whether or not visible process residues are present, all debris is still considered to be radiologically contaminated unless otherwise

specifically identified. Final visual inspection will take place following dismantlement, sizing, and sealing of openings per Specification Section 15065, decontamination per Article 3.1 of Specification Section 01517, and relocation to an approved inspection staging area.

2.3.2 Secondary Waste Management

Management of secondary wastes includes handling, sampling, storage, and disposition of secondary waste materials generated during remediation. Secondary waste includes vacuumed dust, filters, filter cake, personal protective equipment (PPE), spent consumables, and wastewater from gross decontamination and release cleaning.

Depending on the DOE-approved methods for equipment/systems dismantlement, it is possible that up to 130,000 gallons of decontamination wastewater may be generated during the D&D of Multi-Complex D&D project components and Contractor equipment. The projected volume of wastewater from gross decontamination and release cleaning is only a liberal estimate based on previous OU3 D&D projects that used high pressure, low volume water spray. Wastewater will be managed in accordance with the strategies laid out in the OU3 Integrated RD/RA Work Plan. The wastewater collection system will likely include polyethylene-lined containment structure(s) over which equipment is washed, and filters (20 micron pre-filter and 5 micron filter) to remove entrained particulate during transfer into a holding tank. Wastewater handling includes sampling and analysis of water and sludges for constituents of concern (see Section 2.4 for wastewater monitoring), discharge of approved effluent into the FEMP wastewater treatment system (Advanced Wastewater Treatment Facility), and sludge removal and containerization in 55-gallon drums. The Wastewater Treatment System (WWTS) Manager determines the need for wastewater sampling if significant levels of constituents of concern are present, based on an assessment of relevant OU3 RI/FS analytical data and process history. Section 2.4 further discusses wastewater monitoring strategies. The ultimate disposition of wastewater into the WWTS is managed in accordance with existing site procedure EP-005 "Controlling Aqueous Wastewater Discharges into Wastewater Treatment Systems".

2.3.3 Estimates of Material Volumes

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Materials to be generated during this project have been categorized using the same classification system that was developed for and described in the OU3 RI/FS Report (1996a), and OU3 Integrated RD/RA Work Plan, and are estimated in Tables 2-3, 2-4, and 2-5.

2.3.4 Material Handling, Storage, Treatment, and Disposition

Materials generated from the Multi-Complex D&D project will be reduced in size, segregated, and containerized in accordance with the requirements identified in the MSCC form supplied to the Contractor. Quantities and disposition of specific material categories were documented in the PWID form for internal use. Tables 2-3, 2-4, and 2-5 summarize the MSCC and PWID by identifying quantities, containerization, staging/interim storage, and disposal requirements for each category of material. Debris size requirements are described in Sections 3.3.2.1 and 3.3.6.2 of the OU3 Integrated RD/RA Work Plan.

As stated in Section 3.3.2.2 of the OU3 Integrated RD/RA Work Plan, materials will be identified according to the OU3 debris categories identified in the MSCC. The MSCC for the Multi-Complex D&D project allows for commingling of OU3 debris categories A, B, D, and incidental E into the same Roll-Off Boxes (ROBs) since each of these material types conform to OSDF Impacted Material Category 2. The majority of Debris Category E (concrete), however, will be placed in separate ROBs. Commingling of OU3 debris categories A, B, D, and incidental E is being done to conform to the OSDF impacted material categories in order to facilitate placement. By allowing the commingling of these types of debris into the same ROB, there will be more efficient use of a limited number of ROBs at the FEMP. Materials will be containerized inside the project boundaries adjacent to structures being dismantled. Should any materials be encountered that do not meet the OSDF waste acceptance criteria (e.g., materials with "visible process residues" such as yellow cake, black oxide, green salt, etc.) as defined in Specification Section 01120, they will be containerized separately from OSDF-bound materials. These materials will follow the same load-out and transportation procedures, and be packaged for off-site disposal at either the Plant 1 Storage Pad or a material packaging area that would be established within the project boundaries.

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TABLE 2-3 Multi-Complex D&D Project Bulked Material Volume Estimates (yd^3)

Waste Categories

Component Number	Cat. A	Th-C -Cat A	Cat. B	Th-C -Cat B	Cat . C	Cat. D	D- Lead	Cat. E	Th-C -Cat E	Cat. F	Th-C -Cat F	Cat. G	Th-C -Cat G	Cat. H	Th-C -Cat H	Cat. I-2	Cat. I-4	Cat. J	TOTALS
2A	5040.0	900.0	9225.0	202.5	307.4	0.0	42.8	913.5	450.0	600.0	450.0	1140.0	24.0	1117.2	636.0	1012.5	510.0	30.0	22600.9
Pl. 2 Piperack	157.5	0.0	877.5	0.0	20.7	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	344.0	0.0	0.0	0.0	3.0	1405.8
2B	148.5	0.0	571.5	0.0	14.4	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	18.5	30.0	2.0	789.5
2C	121.5	0.0	810.0	0.0	18.6	68.0	2.8	0.0	0.0	0.0	0.0	24.0	0.0	2.0	0.0	1.9	0.0	2.0	1050.8
2D	175.5	0.0	544.5	0.0	14.4	0.0	2.2	0.0	0.0	52.0	0.0	6.0	0.0	12.0	0.0	6.5	1.5	1.0	815.6
2F	38.3	0.0	1836.0	0.0	37.5	0.0	5.6	0.0	0.0	0.0	0.0	206.0	0.0	6.0	0.0	6.5	1.5	1.0	2138.3
2G	21.2	0.0	67.5	0.0	1.8	0.0	0.3	0.0	0	52	0	150.0	0.0	12.0	0.0	7.5	0.0	1.0	313.2
2H	121.5	0.0	810.0	0.0	18.6	0.0	2.8	0.0	0.0	0.0	0.0	40.2	0.0	0.0	0.0	2.0	1.5	3.0	999.6
3A	180.0	0.0	351.0	0.0	10.6	0.0	3.0	112.5	0.0	0.0	0.0	0.0	0.0	740.0	0.0	7.5	6.0	1.0	1411.6
3B	67.5	0.0	13.5	0.0	1.6	8.6	2.4	0.0	0.0	0.0	0.0	102.0	0.0	0.0	0.0	0.5	0.6	2.0	198.7
3C	103.5	0.0	306.0	0.0	8.2	3.6	2.5	0.0	0.0	0.0	0.0	108.0	0.0	344.0	0.0	50.0	15.0	2.0	942.8
3D	585.0	0.0	3532.5	0.0	82.4	0.0	4.0	0.0	0.0	0.0	0.0	150.0	0.0	12.8	0.0	0.0	0.0	7.0	4373.7
3E	247.5	405.0	1665.0	180.0	50.0	0.0	2.4	1426.5	105.0	25.0	0.0	4.8	112.5	0.0	80.0	60.0	18.0	5.0	4386.7
3F	162.0	0.0	294.3	0.0	9.1	0.0	4.0	0.0	0.0	3.3	0.0	0.0	0.0	2.0	0.0	0.0	0.0	1.0	475.7
3H	58.5	0.0	238.5	0.0	5.9	0.0	5.5	189.0	0.0	36.0	0.0	18.0	0.0	14.0	0.0	0.5	1.5	1.0	568.4
3J	126.0	0.0	1701.0	0.0	36.5	0.0	3.0	0.0	0.0	60.9	0.0	0.0	0.0	35.2	0.0	0.0	0.0	1.0	1963.6
3K	0.0	45.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	47.5
3L	99.0	0.0	193.5	0.0	5.9	0.0	0.9	29.3	0.0	0.0	0.0	36.0	0.0	52.0	0.0	0.5	17.7	1.0	435.7
8A	3703.5	495.0	4603.5	495.0	185.9	499.5	24.9	954.0	99.0	393.0	0.0	509.7	509.7	260.0	88.8	75.0	108.0	30.0	13034.5
8B	29.3	0.0	38.3	0.0	1.4	5.4	0.5	1548.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	5.0	3.0	0.0	1633.6
8C	2187.0	0.0	2970.0	0.0	103.1	54.5	15.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90.0	90.0	0.0	5510.5
8D	0.0	0.0	41.0	0.0	0.8	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.1	0.0	44.5
8E	38.3	0.0	54.0	0.0	1.8	1.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	97.5
8G	59.0	0.0	369.0	0.0	8.6	58.5	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.0	3.0	0.0	512.3
8H	387.0	0.0	373.5	0.0	15.2	69.8	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.0	39.0	0.0	946.8
18B	23.4	0.0	1002.0	0.0	61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	1088.9
18D	378.0	0.0	1500.0	0.0	116.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	64.0	20.0	0.0	2078.0
18H	25.8	0.0	1950.0	0.0	120.0	8.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	4.4	0.0	2109.1
18J	0.0	0.0	78.0	0.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	82.8
20E	10.4	0.0	114.0	0.0	6.0	0.0	0.0	17.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	149.4
20F	10.4	0.0	114.0	0.0	6.0	0.0	0.0	17.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	149.4
20G	25.8	0.0	114.0	0.0	6.0	0.0	0.0	17.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	164.8
22B	0.0	0.0	68.4	0.0	4.8	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	93.2
22D	0.9	0.0	216.0	0.0	12.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.0	2.4	0.0	234.8
22E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26A	0.0	0.0	546.0	0.0	31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.0	582.4
26B	1200.0	0.0	930.0	0.0	126.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2256.0
26D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39A	192.0	33.0	34.3	3.0	24.0	4.8	0.8	34.0	6.0	15.6	6.0	0.0	180.0	0.0	2.8	0.0	5.6	10.0	551.9
45A	609.0	0.0	165.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90.0	0.0	30.0	0.0	160.0	50.0	0.0	1104.0
80	75.0	0.0	462.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	150.0	30.0	0.0	717.0
G-008	125.0	0.0	169.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1006.0	0.0	0.0	0.0	0.0	1300.0
TOTALS	16532.6	1878.0	38949.2	880.5	1478.9	782.0	136.7	5280.0	660.0	1237.8	456.0	2584.7	826.2	4001.5	807.6	1792.4	970.4	105.0	79359.4

Footnotes:

(1) OU3 Debris Categories: Cat. A – Accessible Metals; Cat. B – Inaccessible Metals; Cat. C – Process-Related Metals; Cat. D – Painted Light Gauge Metals; Cat. E – Concrete; Cat. F – Brick; Cat. G – Non-Regulated ACM; Cat. H – Regulated ACM; Materials. Cat. I – Miscellaneous

(2) It is assumed that most debris will be decontaminated to remove process residues; however, process equipment/systems that are not amenable to decontamination (e.g., small diameter pipe with process residues) have been estimated based on historical ratios of Cat. C debris to Cat. B debris from other process facilities that have undergone D&D.

(3) ROB: Roll-Off Box holds 30 cubic yards (810 cubic feet) and/or 16.95 tons of material; TL: Top-Loading (also referred to as a Large White Metal Box) holds 35.9 cubic yards (970 cubic feet) and or 18 tons of material; ISO: End-Loading Container/Sea Land boxes, holds up to 36 cubic yards (971 cubic feet) and/or 42,000 lbs. of material.

(4) Excludes gutter cleanout, which will be placed in drums.

(5) OSDF Transfer: On-site Disposal Facility Transfer area. Refers to direct disposal in the OSDF; however, the ability to deliver debris directly to the OSDF Transfer Area is dependent on whether the OSDF is accepting debris and/or availability of containers (ROBs) for transport. If necessary, Category A, B, D, and E debris may be temporarily stockpiled on available building pads at project completion.

(6) If debris cannot be decontaminated to meet visible process residue criteria then off-site disposal will be necessary.

TABLE 2-4 Multi-Complex D&D Project Unbulked Material Volume Estimates (yd^3)

Waste Categories

Component Number	Cat. A	Th-C -Cat A	Cat. B	Th-C -Cat B	Cat . C	Cat. D	D- Lead	Cat. E	Th-C -Cat E	Cat. F	Th-C -Cat F	Cat. G	Th-C -Cat G	Cat. H	Th-C -Cat H	Cat. I-2	Cat. I-4	Cat. J	TOTALS
2A	1680.0	300.0	3075.0	67.5	102.5	0.0	21.4	304.5	150.0	198.0	150.0	760.0	16.0	558.6	318.0	337.5	170.0	30.0	8239.0
Pl. 2 Piperack	52.5	0.0	292.5	0.0	6.9	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	172.0	0.0	0.0	0.0	3.0	528.5
2B	49.5	0.0	190.5	0.0	4.8	0.0	1.1	0.0	0.0	0.0	0.0	8.0	0.0	1.2	0.0	18.5	10.0	2.0	285.6
2C	40.5	0.0	270.0	0.0	6.2	22.7	1.4	0.0	0.0	0.0	0.0	2.0	0.0	1.0	0.0	1.9	0.0	2.0	347.7
2D	58.5	0.0	181.5	0.0	4.8	0.0	1.1	0.0	0.0	17.0	0.0	102.0	0.0	6.0	0.0	6.5	0.5	1.0	378.9
2F	12.8	0.0	612.0	0.0	12.5	0.0	2.8	0.0	0.0	0.0	0.0	50.0	0.0	3.0	0.0	6.5	0.5	1.0	701.0
2G	7.1	0	22.5	0.0	0.6	0.0	0.15	0.0	0	17	0	13.4	0.0	6.0	0.0	7.5	0	1.0	75.2
2H	40.5	0.0	270.0	0.0	6.2	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.5	3.0	323.6
3A	60.0	0.0	117.0	0.0	3.5	0.0	1.5	37.5	0.0	0.0	0.0	34.0	0.0	370.0	0.0	7.5	2.0	1.0	634.0
3B	22.5	0.0	4.5	0.0	0.5	2.9	1.3	0.0	0.0	0.0	0.0	36.0	0.0	0.0	0.0	0.5	0.2	2.0	70.3
3C	34.5	0.0	102.0	0.0	2.7	1.2	2.0	0.0	0.0	0.0	0.0	50.0	0.0	172.0	0.0	50.0	5.0	2.0	421.4
3D	195.0	0.0	1177.5	0.0	27.5	0.0	1.2	0.0	0.0	0.0	0.0	1.9	0.0	6.4	0.0	0.0	0.0	7.0	1416.5
3E	82.5	135.0	555.0	60.0	16.7	0.0	2.8	475.5	35.0	8.2	0.0	0.0	75.0	0.0	40.0	60.0	6.0	5.0	1556.6
3F	54.0	0.0	98.1	0.0	3.0	0.0	1.5	0.0	0.0	1.1	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	159.7
3H	19.5	0.0	79.5	0.0	2.0	0.0	0.5	63.0	0.0	12.0	0.0	0.0	0.0	7.0	0.0	0.5	0.5	1.0	185.4
3J	42.0	0.0	567.0	0.0	12.2	0.0	1.5	0.0	0.0	20.3	0.0	0.0	0.0	17.6	0.0	0.0	0.0	1.0	661.6
3K	0.0	15.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	1.0	31.3
3L	33.0	0.0	64.5	0.0	2.0	0.0	7.8	9.8	0.0	0.0	0.0	9.4	0.0	26.0	0.0	0.5	5.9	1.0	159.8
8A	1234.5	165.0	1534.5	165.0	62.0	166.5	12.5	318.0	33.0	131.0	0.0	339.8	339.8	0.0	44.4	75.0	36.0	30.0	4687.0
8B	9.8	0.0	12.8	0.0	0.5	1.8	0.2	516.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	5.0	1.0	0.0	548.3
8C	729.0	0.0	990.0	0.0	34.4	18.2	7.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90.0	30.0	0.0	1899.4
8D	0.0	0.0	13.7	0.0	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.7	0.0	15.2
8E	12.8	0.0	18.0	0.0	0.6	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	32.9
8G	19.7	0.0	123.0	0.0	2.9	19.5	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.0	1.0	0.0	179.7
8H	129.0	0.0	124.5	0.0	5.1	23.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	60.0	13.0	0.0	356.0
18B	7.8	0.0	334.0	0.0	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	351.1
18D	126.0	0.0	500.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.5	10.0	0.0	681.0
18H	8.8	0.0	650.0	0.0	13.2	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.2	0.0	677.3
18J	0.0	0.0	26.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.5
20E	3.8	0.0	38.0	0.0	0.8	0.0	0.0	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	52.0
20F	3.8	0.0	38.0	0.0	0.8	0.0	0.0	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	52.0
20G	3.8	0.0	38.0	0.0	0.8	0.0	0.0	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	52.0
22B	0.0	0.0	22.8	0.0	0.5	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3
22D	0.3	0.0	72.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	1.2	0.0	76.1
22E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26A	0.0	0.0	182.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	188.3
26B	416.0	0.0	310.0	0.0	14.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	740.5
26D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39A	61.0	11.0	11.4	1.0	2.5	1.6	0.8	17.0	6.0	5.2	6.0	0.0	180.0	0.0	2.8	0.0	2.8	10.0	319.1
45A	203.8	0.0	55.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90.0	0.0	15.0	0.0	80.0	25.0	0.0	468.8
80	25.0	0.0	154.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	75.0	15.0	0.0	269.0
G-008	16.5	0.0	82.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	503.0	0.0	0.0	0.0	0.0	601.5
TOTALS	5495.3	626.0	13008.7	293.5	378.3	260.7	74.3	1777.5	224.0	409.8	156.0	1496.5	610.8	1887.0	405.2	930.9	343.8	105.0	28483.2

Footnotes:
(1) Refer to Table 2-3 for OU3 Debris Category descriptions.

TABLE 2-5 Multi-Complex D&D Project Material Weight Estimates (tons)

Weights reported in tons

Component Number	Cat. A	Th-C -Cat A	Cat. B	Th-C -Cat B	Cat . C	Cat. D	D- Lead	Cat. E	Th-C -Cat E	Cat. F	Th-C -Cat F	Cat. G	Th-C -Cat G	Cat. H	Th-C -Cat H	Cat. I-2	Cat. I-4	Cat. J	TOTALS
2A	896.0	160.0	451.0	9.9	7.6	0.0	6.0	296.0	28.8	156.0	30.0	2.0	3.0	23.3	15.0	55.0	15.0	3.0	2157.6
Pl. 2 Piperack	28.0	0.0	42.9	0.0	0.4	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0	0.0	1.0	92.8
2B	26.4	0.0	27.9	0.0	0.3	0.0	0.5	0.0	0.0	0.0	0.0	3.0	0.0	0.1	0.0	8.0	2.0	0.2	68.4
2C	21.6	0.0	39.6	0.0	0.3	3.0	0.5	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.9	0.0	0.2	67.0
2D	31.2	0.0	26.6	0.0	0.3	0.0	0.5	0.0	0.0	13.5	0.0	0.0	0.0	0.1	0.0	3.2	0.1	0.2	75.7
2F	6.8	0.0	89.8	0.0	0.5	0.0	0.5	0.0	0.0	0.0	0.0	7.6	0.0	0.1	0.0	3.0	0.1	0.2	108.6
2G	3.8	0	3.3	0	0.0	0	0.5	0	0	16.2	0	0	0	2	0	3	0	0.2	29.0
2H	21.6	0.0	39.6	0.0	0.3	0.0	0.5	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.5	0.5	0.2	64.0
3A	32.0	0.0	17.2	0.0	0.2	0.0	0.5	22.5	0.0	0.0	0.0	18.0	0.0	0.0	0.0	3.0	2.0	0.2	95.6
3B	12.0	0.0	0.7	0.0	0.1	0.5	0.8	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.2	0.2	0.2	15.6
3C	18.4	0.0	15.0	0.0	0.2	0.8	0.8	0.0	0.0	0.0	0.0	13.0	0.0	0.2	0.0	10.0	5.0	0.2	63.5
3D	104.0	0.0	172.7	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	1.0	0.0	0.0	0.0	0.2	279.8
3E	44.0	72.0	81.4	8.8	1.0	0.0	0.8	265.3	31.3	7.0	0.0	2.8	0.0	1.0	0.0	10.0	8.0	0.2	551.6
3F	28.8	0.0	14.4	0.0	0.2	0.0	0.1	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	44.5
3H	10.4	0.0	11.7	0.0	0.1	0.0	0.3	37.8	0.0	10.6	0.0	0.0	0.0	0.2	0.0	0.3	0.5	0.2	72.1
3J	22.4	0.0	83.2	0.0	0.5	0.0	1.0	0.0	0.0	15.6	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.2	123.2
3K	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
3L	17.6	0.0	9.5	0.0	0.1	0.0	5.0	5.9	0.0	0.0	0.0	2.5	0.0	4.0	0.0	0.5	3.0	0.2	48.2
8A	658.4	88.0	225.1	24.2	5.0	5.5	0.0	190.8	29.5	74.0	0.0	10.0	0.0	11.0	0.0	25.0	15.0	0.2	1361.6
8B	5.2	0.0	1.9	0.0	0.0	0.1	0.0	309.6	0.0	0.0	0.0	0.0	0.0	0.2	0.0	5.0	1.0	0.2	323.2
8C	388.8	0.0	145.2	0.0	2.7	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	1.0	0.2	544.9
8D	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.2
8E	6.8	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	9.7
8G	10.5	0.0	18.0	0.0	0.1	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.5	0.2	34.4
8H	68.8	0.0	18.3	0.0	0.4	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	2.0	0.2	113.7
18B	6.2	0.0	25.7	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.2	33.1
18D	100.8	0.0	54.8	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	2.0	0.2	169.8
18H	6.9	0.0	71.5	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	79.3
18J	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	3.1
20E	3.0	0.0	4.2	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	14.5
20F	3.0	0.0	4.2	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	14.5
20G	3.0	0.0	4.2	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	14.5
22B	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.7
22D	0.2	0.0	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.6	0.2	9.5
22E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
26A	0.0	0.0	20.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.2	21.1
26B	168.4	0.0	34.1	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	201.7
28D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
39A	24.4	4.4	1.3	0.2	0.2	0.2	0.8	15.8	5.8	4.4	6.0	3.6	1.0	0.2	0.3	0.0	1.0	0.2	69.7
45A	65.0	0.0	23.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	1.0	3.0	0.2	95.6
80	20.0	0.0	33.9	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.0	2.0	0.2	79.3
G-008	13.2	0.0	18.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	160.0	0.0	0.0	0.0	0.2	191.6
TOTALS	2875.7	324.4	1847.5	43.1	25.5	19.3	20.1	1166.7	95.4	298.1	36.0	65.7	4.0	228.0	15.3	187.6	63.4	12.0	7347.8

Footnotes:
(1) Refer to Table 2-3 for OU3 Debris Category descriptions.

The current project strategy for managing debris is to deliver containerized debris directly to the OSDF Transfer Area; however, short-term debris stockpiling (staging) of Category A, B, D and E debris is likely to occur due to the limited number of ROBs at the FEMP during months when the OSDF is not placing debris. Staging of debris in temporary stockpiles, if needed, will follow the strategies provided under Section 3.3.2.3 of the OU3 Integrated RD/RA Work Plan, which requires best available storage configuration for OU3 Debris Categories A, B, D, and E. The strategy for staging debris in temporary stockpiles also requires removing or encapsulation of contaminants. Specification Section 01517 debris release criteria requires that gross contamination be removed or encapsulated on debris surfaces prior to their removal from a building enclosure or local containment. To the maximum extent practicable, debris will be containerized following sizing when sufficient containers are available. Should the best available storage configuration (i.e., containers with lids or tarps) be temporarily unavailable, temporary stockpiling of debris on pads with run-off controls would be performed.

Debris estimates for the Multi-Complex D&D project have been provided to OSDF and waste management integrators for the purpose of optimizing types and quantities of debris that are available or will be generated from all D&D projects for OSDF placement. The OSDF Optimization Plan was developed originally in June 1999 and provided to the U.S. EPA. It is continually updated based on the latest schedules and debris projections. The OSDF Optimization Plan integrates schedules and estimates for soil and debris generation to allow for efficient use of site resources and cell construction. Complicating the scheduling of debris transfers will be the concurrent implementation of other D&D projects (Plant 6/East Warehouse, Administration Complex, Pilot Plant Complex, Plant 1 Complex – Phase II, and Laboratory Complex.)

Material tracking is performed using the Site-Wide Waste Information, Forecasting and Tracking System/Integrated Information Management System (SWIFTS/IIMS) through the FEMP waste management organization. Project-specific reporting on material disposition will be provided by a SWIFTS/IIMS summary in the Project Completion Report. Section 3.3.2.2 (Segregation, Containerization, Tracking) of the OU3 Integrated RD/RA Work Plan describes material tracking and reporting using SWIFTS. OU3 Debris Categories A, B, D, and E debris are classified as OSDF Category 2 material. Therefore, commingled Debris Categories A, B, D, and E quantities will be tracked in SWIFTS/IIMS under a discreet Material Evaluation Form

that corresponds to Impacted OSDF Category 2 debris in interim storage. OU3 Debris Category I (Miscellaneous Materials) is also OSDF Category 2 but will not be commingled and therefore actual volumes will be easily obtained. Debris Category G (Transite) and Debris Category H (Regulated ACM) are regarded as OSDF Categories 3 and 5, respectively, and will also be handled separately. Since the volume of commingled debris will represent a combination of waste streams, proportions of OU3 debris categories within that total volume will be derived based on original estimates to identify and track waste volumes by OU3 debris category. These derived quantities will be documented in the Project Completion Report for the Multi-Complex D&D project. Other than tracking debris specifically for the purpose of OSDF placement, project-specific material tracking and reporting strategies for the Multi-Complex D&D project do not differ from the strategies laid out in the OU3 Integrated RD/RA Work Plan and therefore no additional details were developed during the remedial design process.

The disposition strategy for Multi-Complex D&D project materials is consistent with the requirements stated in the OU3 Final Action ROD (1996b) and strategies presented in the OU3 Integrated RD/RA Work Plan. Table 2-2 identifies the debris disposition routes, including either onsite (OSDF) or offsite (which includes either the NTS or a Permitted Commercial Disposal Facility). No treatment will be necessary for those materials destined for on-site disposal since all chemical-based waste acceptance criteria are met based on OU3 RI/FS data.

2.3.5 Material Recycling/Reuse

Accessible metals (Category A) from the Multi-Complex D&D project have been evaluated for potential recycling options and a detailed summary of that evaluation is available in Appendix B. Using the Decision Methodology for Fernald Material Disposition Alternatives (the "Decision Methodology"), 7348 tons of potentially recyclable accessible metals (OU3 Debris Category A) from all Multi-Complex D&D project components were evaluated by comparing the four leading alternatives to on-site disposal. Of the three phases of the Decision Methodology (Threshold Phase, Life Cycle Analysis Phase, and Decision Phase), only the first phase was applied since the comparative evaluation of project costs for each alternative showed that the total costs for each of the recycling options greatly exceed the 25 percent total cost criteria compared to OSDF disposal.

2.4 Environmental Monitoring

Environmental monitoring for the Multi-Complex D&D project will only include wastewater monitoring. Groundwater monitoring is not needed to support this project but would be employed if necessary, as described in Section 3.6.2.3 of the OU3 Integrated RD/RA Work Plan.

The FEMP Stormwater Pollution Prevention Plan (DOE 1996c) governs project-specific stormwater management and any monitoring associated with that program is managed by OU5/Aquifer Restoration Project. Project-specific stormwater management includes the diversion of stormwater to appropriate site collection drains surrounding the project.

Surface Water (Wastewater) Monitoring

Section 2.3.2 of this Implementation Plan describes the wastewater management strategies that have been developed for the D&D of the Multi-Complex D&D project. The OU3 Integrated RD/RA Work Plan describes the overall strategies to be implemented for project monitoring of wastewater. Listed below are the specific references in the Work Plan:

- **Section 3.2.5 Surface Decontamination:** Wastewater collection and management strategies.
- **Section 3.3.3 Management of Secondary Waste:** The overall strategy for managing wastewater, as one of the primary aspects of secondary waste, through the site wastewater treatment system.
- **Section 3.5.2 Management of Contaminated Water:** References site procedure to be used for the evaluation and management of contaminated wastewater.
- **Sampling and Analysis Plan (SAP)/Section 2 General Sampling and Data Collection Approach:** Focuses on wastewater sampling, among other aspects of sampling.
- **SAP/Section 3 Specific Sampling Programs:** Sampling for disposition of wastes, including wastewater. Determination of hazardous, radiological, and other waste characteristics.

The WWTS manager has been provided with a spreadsheet containing OU3 RI/FS analytical data from intrusive sampling of the Multi-Complex D&D project components to determine whether potential elevated levels of contaminants of concern may be present. Based on an estimated 130,000 gallons of potential washwater, it is anticipated that 43 samples will be

taken to determine isotopic radiological and heavy metals concentrations prior to discharge into the Advanced Wastewater Treatment Facility. Of those 43 samples, three will be duplicates for quality assurance/quality control purposes. The purpose of the sampling is to ensure the adequacy of treatment capacity so that National Pollutant Discharge Elimination System (NPDES) permit requirements are met.

Project-specific reporting for wastewater will be provided in the project completion report. The report will include a summary of the data generated during the project. For wastewater, the report will include a summary of the results from sampling and analysis prior to its discharge into the WWTS.

Radiological Air Monitoring

Occupational radiological air monitoring will be performed using personal and workplace air samplers in the work areas to ensure worker protection and will also serve as an indication of the effectiveness of engineering controls. Since Multi-Complex D&D project buildings will be contained (i.e., enclosed) during D&D, any potential emissions that could affect the outside environment would be detected first by occupational radiological air monitoring. Section 8.1 of the OU3 RD/RA Health and Safety Plan (Appendix E of the OU3 Integrated RD/RA Work Plan) describes the occupational air monitoring program.

Environmental radiological air monitoring during the Multi-Complex D&D project will consist of the Fernald Site Environmental Monitoring Program described in the site-wide IEMP, and discussed in Sections 3.5.1 and 3.6.2.1 of the OU3 Integrated RD/RA Work Plan. FEMP boundary monitors are shown in Figure 2-1.

The need for a supplemental environmental radiological air monitoring program for this D&D project was evaluated by modeling the potential release of radiological (uranium) contaminants from the components during D&D. The result of that modeling effort reveals that uranium emissions would be negligible and therefore, supplemental radiological monitoring is not warranted.

Radiological survey data were used for the air emissions modeling input. Computer modeling of potential uranium emissions from Multi-Complex components was performed using the

CAP88PC method to measure potential dose impacts from the project. CAP88PC is the personal computer version of the U.S. EPA model CAP88 that is the approved method for predicting dose impacts to off-site personnel from emissions of radionuclides under the National Emissions Standards for Hazardous Air Pollutants (NESHAPs) regulations. The CAP88PC model is being used as a tool to assess potential dose to off-site personnel from radionuclide emissions from a project in order to identify potential mitigative controls and supplemental monitoring measures; it is not being used as a means to demonstrate compliance with NESHAPs Subpart H. The method to be used for demonstrating NESHAPs Subpart H compliance is presented in the IEMP as a collective sitewide strategy.

The CAP88PC modeling methodology is prescribed by the U.S. EPA reference manual: U.S. EPA User's Guide for CAP88, Version 1.0, 402-B-92-001. Computer modeling of potential radiological emissions from the Multi-Complex D&D project used radiological smear data to provide a more realistic measure of removable alpha, beta, and gamma contamination rather than fixed contamination (identified through intrusive sampling results from the OU3 RI/FS database and direct surface contamination surveys) for estimating contaminant release. The removable contamination data obtained through smear sampling represents a model input that depicts worst-case emissions since it represents removable contamination present prior to the decontamination activities.

The modeling methodology assumed no controls on emissions release, such as HEPA filters on containment ventilation systems and a percentage (of removable contamination) that would become airborne during D&D activities. Potential emissions sources were treated as being in readily dispersible forms. The results of the computer modeling indicated that the maximally exposed individual would theoretically be located approximately 904 meters east-southeast of the project area and would potentially receive a maximum Total Effective Dose Equivalent of 4.3×10^{-4} mrem/year from the D&D activities. Based on a review of the results of the computer modeling, no supplemental environmental air monitoring will be required for the Multi-Complex D&D activities.

Further justification for not providing project specific air monitors comes from analysis of data from the Plant 7 Dismantling - Removal Action No. 19 Final Report (DOE 1995), the Project Completion Report for Building 4A (DOE 1997c), the Plant 1 Complex - Phase I Project

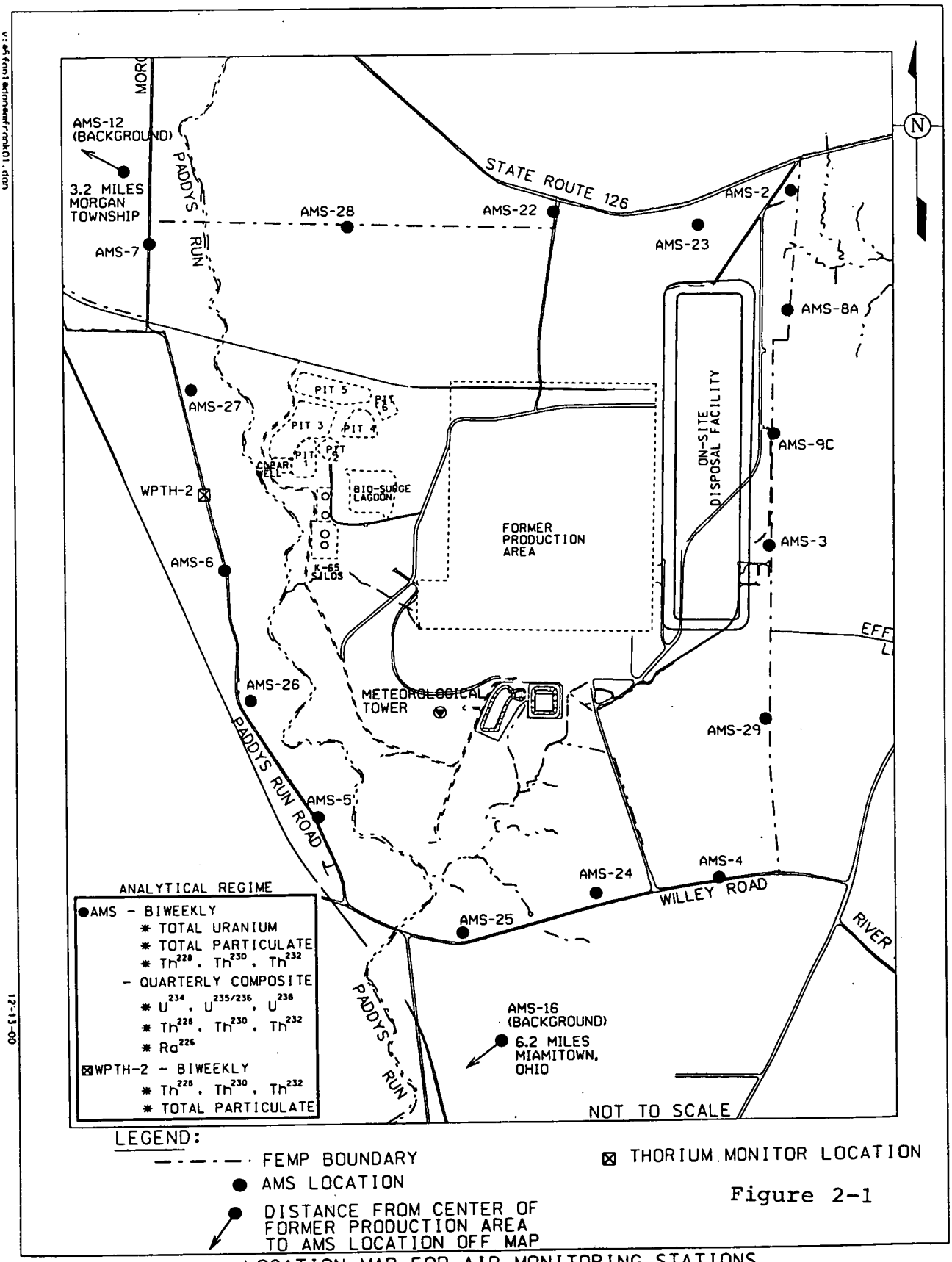

Figure 2-1

LOCATION MAP FOR AIR MONITORING STATIONS

Completion Report (DOE 1997d), and the Thorium/Plant 9 Complex Project Completion Report (DOE 1999a), which have shown that dismantlement activities resulted in negligible airborne radiological contaminant emissions. Results for airborne uranium contamination during those projects have been approximately 5 percent of the DOE maximum off-site guidelines of 0.1 pCi/m3. The relationship between pCi/m3 and mrem/year may be understood by the conversion factor used to equate the two terms at the FEMP: if inhaled continuously (24 hours/day, 365 days/year), 0.1 pCi/m3 of uranium in air will result in a dose of 100 mrem/year. It should be noted that various assumptions have been incorporated into this conversion factor. Mitigative measures that might be employed in the event the set criterion are exceeded would include an increase in engineering and administrative controls during a particular task that has been identified as the cause or possible cause of the elevated radiological levels. Such controls could include negative pressure within an enclosed work area using additional HEPA filtration units or additional surface cleaning (wash) steps before removing material from the containment area.

2.5 Remediation Activities

A general approach to the D&D of the Multi-Complex D&D project is described in the following subsections. Section 3 elaborates on this discussion by identifying component-specific interests concerning the remedial tasks listed below, as applicable. The remedial tasks that apply to the Multi-Complex D&D project include the following:

- Preparatory Action: Inventory Removal;
- Preparatory Action: Facility/Safe Shutdown;
- Hazardous Waste Management Unit Closure Tasks;
- Asbestos Removal;
- Surface Decontamination; and
- Above-Grade Dismantlement.

As required by Specification 01515 (Mobilization), the remediation contractor will mobilize in preparation for the D&D activities by establishing the construction zone boundary and material handling and containerization area(s), providing portable support facilities as needed, extending water and electrical utilities from designated tie-ins, and establishing stormwater controls. Site preparation will be performed by the contractor including installing the necessary break and

control point trailers to the designated area prior to contractor mobilization. The contractor will also supply an asbestos hygiene trailer/facility.

The proposed construction zone boundary is delineated in the Civil Demolition Plan drawing, a copy of which is included in Appendix D. Equipment that are potentially contaminated due to a history of use at another radiological facility will be inspected by FEMP Project Management and surveyed by radiological control technicians to ensure that no contamination or items prohibited by the FEMP are brought on-site. A sign-in station will be established at the entrance to the job site for posting of permits and health and safety plans. Additional radiological control boundaries will be established in various areas as necessary prior to starting remediation activities in those areas. These boundaries will be established prior to starting in order to locate contaminated material staging areas as well as access and egress points to and from contaminated areas.

As required in the performance specifications, the remediation contractor will develop and submit for FEMP Project Management approval safe work plans detailing work activities. Examples of such plans include details relative to where the remediation contractor will erect barriers and fences for radiological control (Specification Section 01515), controlling fugitive emissions (Specification Section 15067), stormwater run-off protection (Specification Section 01515), and controlling erosion (Specification Section 01515). Throughout the remediation activities, the remediation contractor will be responsible for notifying FEMP Project Management of conditions in the field (e.g., chemical spills, leaking containers) that require environmental response. All conditions that necessitate a response will be dealt with immediately.

2.5.1 Preparatory Action: Inventory Removal

Waste/product inventories have been removed from Multi-Complex D&D project components and were transported to interim storage facilities or off-site disposal facilities under the decisions and procedures adopted from Removal Action No. 9, Removal of Waste Inventories. For those components that had inventory removed, a summary of inventory types and quantities has been provided in the respective Section 3 component-specific remediation details.

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2.5.2 Preparatory Action: Facility/Safe Shutdown

Safe Shutdown activities were performed by FEMP personnel under Removal Action R. A.No. 12 procedures and reported in the RvA No. 12 Close-Out Report (DOE 1999b). Hold-up removal activities were performed for facilities associated with Plants 2, 3, and 8. The combined Safe Shutdown/Facility Shutdown scope consisted of the following activities:

- removal of all salvageable equipment;
- removal of loose, gross contamination;
- removal of hold-up material;
- general clean-up; and
- disconnection of all utilities.

All steam, potable water, electrical power, fire protection alarms and systems, compressed air, and communication systems have been disconnected at the equipment or at the building exterior, with the exception of 3A & 3L, to establish the known condition of each energy source within the remediation area. Section 3.2.2 of the OU3 Integrated RD/RA Work Plan further discusses the scope of this preparatory action. Since the RvA No. 12 Close-Out Report details component-specific hold-up removal information (i.e., material types and quantities removed), such information will not be repeated in the individual component remediation summaries in Section 3.

2.5.3 Hazardous Waste Management Unit Closure Tasks

Seven HWMU closures are planned for the Multi-Complex D&D project. Pursuant to the OU3 Integrated RD/RA Work Plan, this Implementation Plan provides the RCRA/CERCLA Integrated Closure requirements for the following HWMUs:

- HWMU No. 10 – NAR System Components (Building 2A);
- HWMU No. 14 – Box Furnace (Component 74R, adjacent to Building 8A);
- HWMU No. 15 – Oxidation Furnace #1 (Building 8A);
- HWMU No. 29 – Plant 8 Warehouse (Building 80);
- HWMU No. 47 – UNH Tanks North of Plant 2A (Building 2A);
- HWMU No. 48 – UNH Tanks Southeast of Plant 2A (Component 18B); and
- HWMU No. 49 – UNH Tanks Digestion Area (Building 2A)

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Subheadings entitled, "Hazardous Waste Management Unit Closure Tasks", are provided in Section 3 for each component that has HWMUs being closed under the RCRA/CERCLA Integrated Process.

Again, it should be noted that HWMU Nos. 28 (Trane Incinerator) and 50 (UNH Tanks – Hot Raffinate Building) already underwent RCRA/CERCLA closure under accelerated HWMU closure task orders in 1999 (DOE 1999c and 1999d) and HWMU No. 46 (UNH Tanks – NFS Storage Area) already underwent RCRA/CERCLA closure under the MSS D&D project in 2000.

2.5.4 Asbestos Removal

The removal of ACM from components will be conducted by a contractor qualified to conduct asbestos abatement operations. This activity will involve removing all friable types of asbestos, typically consisting of thermal system insulation (TSI) on pipes, tanks, and equipment and non-friable ACM such as floor tile, mastic, gaskets, etc.). Component-specific details of asbestos removal, including estimated quantities, are provided in Section 3, as applicable. ACM removal strategies that will be applied to this project were discussed in depth in Section 3.2.4 of the OU3 Integrated RD/RA Work Plan while overall project specific requirements for the D&D Contractor are detailed in Specification Section 01516.

2.5.5 Surface Decontamination

Surface decontamination, also known as release cleaning, refers to the removal of loose surface contamination and, if necessary, the encapsulation of remaining contaminants. The goal of surface decontamination is to minimize the potential for release of contaminants during handling and disposal. Specification Section 01517 addresses the removal and/or fixing of radiological contamination and generally covers the following activities:

- cleaning low-level uranium & thorium contaminated materials and/or building surfaces by contaminant removal or encapsulation to meet debris and/or structure release criteria;
- cleaning process equipment and materials to remove visible process residues, if practicable; and
- controlling and moving effluent produced during the removal and/or encapsulation of contamination.

To identify materials/surfaces that may require surface cleaning, existing radiological surveys were reviewed. These surveys provide Radiological Engineers with an indication of the extent of alpha removable, and beta-gamma removable, and total beta-gamma radiological contamination.

Prior to removing debris from a building enclosure or local containment, all external surfaces will be cleaned per Specification Sections 01517 and 01120. Specification Section 01517 identifies the requirements for removing/fixing of contamination, including DOE-approved methods, while Specification Section 01120 identifies the level of decontamination needed to meet material handling criteria. Among other requirements, these specifications require removal of gross surface contamination and sealing of all openings of equipment and debris that are potentially contaminated internally with removable contamination. For large items such as ductwork, the Contractor may encapsulate all internal surfaces in lieu of sealing. Acceptable methods for removing surface contamination include, but are not limited to: low volume hydro-blasting with a minimum of 1,000 psi, steam-cleaning, sponge blasting, CO_2 blasting, etc. FEMP Project Management will be notified prior to encapsulation of debris to allow for inspection for visible process residues. Acceptable methods for encapsulating contamination, which is not readily removed by the above-identified methods include, but are not limited to, encapsulating coatings, non-strippable coatings as referenced in Article 2.2 of Specification Section 01517, and reinforced polyethylene sheeting which is sealed prior to movement to prevent migration of potential contaminants.

Internal & external surfaces of process pipe will be decontaminated per Specification Section 01120 and Specification Section 01517. Internal surfaces of process piping are assumed to exceed both the removable and total contamination limits for uncontained demolition and are not amenable to decontamination. Additionally, specific equipment/systems may be designated as "process debris" by FEMP Project Management prior to contractor initiating efforts to remove process residues. Such determinations will be made based on experience and knowledge by FEMP Project Management as to the effort that would be needed to remove such material.

Prior to opening the structures that require decontamination to the environment, either by removal of exterior siding or by dismantlement, the Contractor is required to remove and/or

fix radiological contamination on all surfaces in the facility until the detected radioactivity levels are below the facility release criteria identified in Part 8.C. of the contract (Radiological Requirements Plan). FEMP Project Management will perform a radiological release survey to ensure the radioactivity criteria are met.

2.5.6 Above-Grade Dismantlement

All above-grade dismantlement activities to be performed during the Multi-Complex D&D project are described in Section 3.2.6 of the OU3 Integrated RD/RA Work Plan. The specification sections listed below describe various project applications of structural building/component dismantlement:

- Bulk Removal: includes removal of electrical components, piping, construction debris, and heating, ventilation and air conditioning (HVAC) systems: (Specification Section 15065);
- Equipment/System Dismantlement: Specification Section 15065;
- Transite Removal: Specification Section 07415;
- Structural Steel Dismantlement: Specification Section 05126; and
- Concrete/Masonry Removal: Specification Section 03315.

The remediation contractor is required by each of the above-referenced specifications to submit a Safe Work Plan for approval by FEMP Project Management. Content, such as methods, and submittal requirements for Safe Work Plans are described in each of the performance specification sections. Based on these and other supporting specifications, a general description of above-grade dismantlement tasks is described below, while building-specific above-grade dismantlement tasks are discussed in Section 3.

Bulk Removal

Prior to breaching any system, the remediation contractor and FEMP Project Management will verify that all the systems are de-energized.

The majority of piping, valves, electrical components, conduit, wire, cable trays, construction debris, and HVAC systems will be removed and reduced in size. During removal of HVAC ductwork, internal surfaces will be visually inspected to ensure the absence of free liquids or solid materials. If free liquids or solid materials are found, an evaluation will be initiated by the

FEMP Project Manager to determine the requirements for material handling and removal. The evaluation will identify the contents and requirements for containerization, storage, and disposal. If the item fails visual inspection, it will be labeled as "process debris" (designated by red paint) unless the item is decontaminated free of such residues and thereby rendering it as "non-process" debris. Specification Section 01120 (Part III) describes the decision process used to evaluate whether debris is to be labeled as "non-process" or "process" and the action to be taken for each.

Methods such as reciprocating saws, portable band saws, and shears are the preferred methods for bulk removal. Surface wiping or HEPA filtered vacuuming may be required for contaminated surfaces where cuts are planned in order to minimize transferable contamination. Methods that minimize volatilization and release of paint constituents and other contamination are preferred; however, alternative methods may be proposed provided that HEPA-filtered local ventilation and adequate respiratory protection are used. Continuous workplace air monitoring for radioactivity will be performed to ensure that engineering controls employed by the Contractor are adequate.

Equipment/System Dismantlement

As equipment/systems are removed, the previously inaccessible surfaces will be visually inspected to ensure the absence of free liquids or debris. If these materials are found, an evaluation will be initiated by FEMP Project Management to determine the appropriate removal and handling requirements for the material (Specification Section 15065).

The Contractor will detail in its Safe Work Plan for equipment removal the sequence, methods of removal and dismantlement, equipment required, catalog cut sheets, drawings and methods and materials to control generation of airborne contaminants from cutting operations, etc. Staging of removed equipment and size reduction will be proposed by the Contractor and approved by FEMP Project Management.

Transite Removal

Specification Section 07415 addresses the requirements for removal of interior and exterior transite panels. Prior to removing any transite panels, a coating of amended water or encapsulant will be applied to lock down any loose fibers. A screw gun or bolt cutter is the

preferred method for removing the panel fasteners. If the fasteners are not removed with a screw gun, then the area around the fastener will be sprayed with a fixative allowing the fastener to be pried out. Prior to locking down contamination, Specification Section 07415 requires the remediation contractor to demonstrate the proposed method to be utilized. After the screw is pried out, the fixative will be reapplied. If a broken panel is encountered, then the area around the break will be sprayed with amended water or encapsulated with the fixative. HEPA vacuums will be available to collect any loose material.

Mineral wool batt insulation will be removed and containerized during interior transite removal. As batt insulation is removed, a visual inspection and a radiological survey will be performed on the newly exposed surfaces. Indications of friable asbestos will require removal of loose material cleaning and locking down the remaining fibers in place. If radiological survey results indicate the need to perform decontamination or lock down of the areas to levels consistent with surrounding building surfaces, then these activities will be performed. Fasteners and molding that hold the panels and insulation in place will also be removed as part of this operation. In some instances, the interior transite roof panels may be removed after the exterior transite panels have been removed.

Transite panels will likely be removed in the following manner: 1) spraying encapsulant on the interior and exterior of the panels using an airless or hand-held sprayer by workers on the ground or in a manlift; 2) manually detaching the panels by removing fasteners (fasteners are collected as lead metal); and 3) lowering panels by hand if on ground level or, for elevated removal, lowering the panels using a scissor lift/elevated work platform.

Prior to exterior transite panel removal, Specification Section 07415 specifies that the remediation contractor shall remove and or fix radiological contamination on all structural surfaces within the facility until the detected radioactivity levels are below the criteria defined in Part 8 of the IFB/RFP.

Structural Steel Dismantlement

Specification Section 05126 addresses structural steel dismantlement requirements. Exterior metal panels will be left in place on the structural steel members. All remaining items, such as non-load bearing steel members, windows and frames, doors, gutters and down spouts, will

be removed using mechanical means. As these items are removed, the exposed component surfaces have the potential of holding debris and contamination. These areas will be visually and radiologically surveyed as required to determine if these surfaces meet the decontamination requirements of Specification Section 01517.

For all of the components in the Multi-Complex D&D project, hydraulic shears or oxy-acetylene torches are expected to dismantle and size reduce the structural steel frame. Prior to and during structural dismantlement, the area surrounding the structure will be sprayed with water as necessary to reduce fugitive dust emissions.

The D&D Contractor will be required, pursuant to Specification Section 05126, to specify in a Safe Work Plan for structural steel removal the following methods:

- Detailed sequence of dismantlement and method of cutting, including equipment to be used;
- Methods for contaminant control, including fugitive emissions during cutting;
- Detailed plan for protecting lay down and cutting areas from contamination by lead paint chips and for controlling airborne radiological emissions;
- Methods and materials used for cutting lead-painted steel;
- If structural steel is removed in sections, verify the structural adequacy of the remaining structure. Calculations and drawings to verify the structural integrity of the partially dismantled structure must bear the stamp of a Registered Professional Engineer; and
- Plans for personnel tie offs, use of pick boards and walking on or near roof purlins/girders.

Furthermore, Specification Section 05126 requires that the remediation contractor apply mechanical means of cutting to remove the structural steel to the largest extent possible while also avoiding damage to adjacent structures, components, equipment, and utilities.

Concrete Masonry Unit (CMU) Removal

Specification Section 03315 requires the remediation contractor to develop a Safe Work Plan for concrete/masonry removal that contains the following information:

- Detailed method and sequence of dismantlement, including equipment to be used;
- Methods for control of contaminants, including control of fugitive emissions;
- Materials, such as non-woven geotextile fabrics and surfactants, to be used;

- Methods of cutting, including equipment to be used;
- Calculations to verify structural adequacy of partially dismantled structure, as applicable; and
- If dismantlement method requires personnel on the roof, the Contractor shall provide calculations verifying the structural adequacy of the roof to support personnel and equipment. These calculations shall be stamped by a Registered Professional Engineer.

The CMU walls will be radiologically surveyed prior to removal to determine the need for engineering controls, such as an enclosure with ventilation or water sprays to minimize fugitive dust, during removal operations. When controls are necessary, best available control technologies will be applied to CMU removal operations.

Specification Section 01515 addresses requirements relative to the preparation of the base slab during demobilization. Specifically, small openings in the slab will be filled with granular material or soils and grout to provide a flat uniform surface to mitigate potential safety hazards. Larger openings will be barricaded to prevent potential safety hazards. Wire and cable will be cut away to grade from the conduit embedded in the concrete. Conduit and other slab obstructions will be cut away to grade, plugged, and covered with grout to grade level for positive drainage control.

2.6 Use of New Technologies

The FEMP Technology Programs department will provide information to prospective bidders of the D&D contract regarding the availability of new and innovative technologies that are available and approved for D&D work. While the performance specifications provide an avenue for the contractors to propose new and innovative technologies, FEMP Project Management can only encourage use of particular technologies by apprising them of approved technologies at the pre-bid meeting or in performance specifications. FEMP Technology Programs department will present to prospective bidders information supporting use of the latest innovative technologies that have been shown through site technology demonstrations to provide safer, quicker, and/or less expensive remediation.

3.0 COMPONENT-SPECIFIC REMEDIATION

This section presents component-specific remediation tasks identified for the Multi-Complex D&D project. Background information provided in this section was obtained primarily from the OU3 RI/FS Work Plan Addendum (DOE 1993), records from Removal Actions 9 and 12, and the remediation contract Statement of Work (SOW). Structural (plan and section view) drawings have been compiled for each of the Multi-Complex D&D project components and are shown in Appendix D (see Appendix D list of drawings for component identification). Photographs illustrating various features throughout the Complex are provided in Appendix E (see listing of photograph numbers and accompanying drawing in Appendix E for photograph identification). Information regarding the remediation approach was obtained from the remediation contract SOW, performance specifications, and the OU3 Integrated RD/RA Work Plan.

3.1 Building 2A – Ore Refinery Plant

Background

Building 2A (Ore Refinery Plant) consists of a structural steel frame with transite panel outside walls and roof that is approximately 62 ft. x 382 ft. and 50 ft. high. It is a multilevel building having five levels and a penthouse. The interior of the building is divided into three areas that separated by transite walls. The building floor is a combination of acid brick and concrete. The building is located south of 2nd Street, east of A Street, and west of B Street, as shown on the project demolition plan drawing in Appendix D. Building 2A operations used nitric acid digestion processes to convert uranium ores, oxides, metal, and residues into uranyl nitrate solutions, which were then purified. Appendix D also provides drawings that show the floor plan layout and section views of Building 2A, while photographs are provided in Appendix E.

Process Area Description

Five processes have been identified in Building 2A: digestion, drum digestion, extraction, denitration, and enriched calcining.

Digestion: The digestion area is located in the west portion of Building 2A and is divided into two distinct processions. The northern half of the plant was used for digesting uranium ores

and residues that had a high radium content (the "hot" side). The southern half of the building handled uranium materials with little to no radium (the "cold" side). Uranium ores and residues were received on the top floor of Building 2A from the bucket elevators associated with the cold side ore conveyor (Component 2F) and the hot side ore conveyor (Component 2G). The digestion process prepared dilute uranyl nitrate (UNH) by dissolving these uranium ores and uranium-bearing residues in nitric acid. The UNH was then transferred to the extraction area for purification processing.

Drum Digestion: The drum digestion area, also known as the mini-digestion area, is located in the middle of the first floor of the ore refinery digestion area. It is a diked area, with a metal floor and stations for eight drum digester tanks. The drum digestion area was used to digest highly enriched uranium materials (up to 2.5% U-235) received from the Preparation Plant (Building 1A). Premeasured batches of specified materials were received in the drum digester tanks from the Preparation Plant. Nitric acid and water were added to the tanks and then thoroughly mixed. When the digestion process was complete, the material was recycled through a plate-and-frame filter or through a cartridge filter until it was clear. Then the material was pumped through one of two polishing cartridges filters and into tank F1-12, located in the middle of the drum digestion area. The material was then pumped into other tanks for storage or into tanks to be blended with other digestion products for extraction feed. The drum digestion process occurred until the early 1980s.

Extraction: The extraction area is located in the central portion of Building 2A. The extraction process was carried out with equipment located on the north side of the building. The purpose of the liquid-liquid countercurrent solvent extraction operation was to purify uranyl nitrate solution. This was accomplished by contacting the solution with organic solvent (tributyl phosphate in kerosene) in stainless steel, perforated plate pulse columns. In so doing, uranyl nitrate transferred to the solvent phase, leaving most of the impurities in the aqueous raffinate. The solvent phase was then scrubbed by contacting it with a small amount of deionized water to remove residual contaminants. Degraded solvent is recovered through an acid-charcoal treatment. The uranyl nitrate was returned to an aqueous solution by contacting the uranium-rich solvent with hot, deionized water, yielding a solution of uranyl nitrate.

Denitration: The denitration area is located in the eastern portion of Building 2A. Purified aqueous uranyl nitrate solution is thermally decomposed into uranium trioxide (UO3) powder in the denitration area. The main elements of denitration equipment were 2 boildown tanks, 3 sparge tanks, and 14 denitration pots. Feed material was cascaded from the boildown tanks, through the sparge tanks, and to the denitration pots by gravity. Concentration of pure uranyl nitrate solution was accomplished in the boildown tanks and sparge tanks. Molten uranyl nitrate hydride was fed to denitration pots for conversion to UO3. From the denitration pot, UO3 was gulped and packaged for further processing.

Enriched Calcining: The safe geometry rotary calciner, in which up to 10% enriched UNH solution was calcined to produce black oxide (U3O8) for use as sweetener, is located on the southern side of the third level in the denitration area.

Remedial Tasks

Five remedial tasks apply to Building 2A and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility. Safe shutdown activities included the removal of all hold-up material within the equipment, piping and ductwork systems. Removal Action 12 - The Safe Shutdown Closeout Report (DOE 1999) provides further information related to types and quantities of hold-up material removed from Plant 2/3 during Safe Shutdown.

HWMU Decontamination

Three HWMUs exist in Building 2A that will undergo decontamination measures to provide for RCRA/CERCLA Integrated Closure. These include: 1) HWMU No. 10 NAR System Components; 2) UNH Tanks – Southeast of Plant 2A; and 3) UNH Tanks – Digestion Area. The background and requirements for decontamination are detailed below.

HWMU No. 10:

The Nitric Acid Recovery (NAR) System was used to collect nitric acid and nitrogen oxides (NOX) generated from the acid extraction of uranium from ores and residues in Plant 2. The system recovered nitric acid for reuse in Plant 2 production and also controlled NOX emissions

from the Plant 2 production process. The NAR System occupies an area of approximately 13,262 ft^2 and includes nine tanks and vessels. The following components are located inside Plant 2:

- Tank F3E-220 is a cylindrical, stainless steel tank with a capacity of 3,500 gallons. It is located on the first floor in the southwest end of the Denitration Area. The tank was used for the storage of liquids from the Venturi Scrubber (Tank G3E-207).
- Two liquid coolers, E3-210 and E3-211, are cylindrical, stainless steel tanks measuring approximately 1.5 ft. in diameter by 12 ft. high. They are located on the first floor in the northwest end of the Denitration Area. The liquid coolers were used to cool the nitric acid from the scrubber. Ancillary equipment includes pumps and piping.
- Weir Boxes F3E-207, F3E-213, F3E-215 and F3E-218 are mounted above the Denitration Tanks on the second floor on the North side of the Denitration Area. These units are made of steel and measure approximately 3 ft. by 4 ft. by 0.67 ft. Ancillary equipment includes the associated piping.
- The Venturi Scrubber (G3E-207) is mounted above the Weir Boxes on the second floor in the north side of the Denitration Area. Vapors from the UO3 gulping transfer passed through the Venturi Scrubber where the scrubber liquid removed water vapor, dust, and NOX vapors. The scrubber is a 7 ft. tall stainless steel vessel that measures approximately 1.5 ft. in diameter at the top and 1 ft. in diameter at the bottom. Ancillary equipment includes the associated piping.

The secondary containment area for the NAR System components inside Plant 2 is provided by the concrete floor and building walls. Tank F1-24 is the only component of the NAR System that is located outdoors. It is an aboveground, cylindrical, stainless steel tank located in the NAR tank storage area at the southwest end of Plant 2/3. The capacity of the tank is 30,500 gallons. The tank sits on a flat, tar-sealed, concrete pad surrounded by a 3 ft. concrete wall. Two other storage tanks (not part of HWMU No. 10) are also located in this secondary containment area. Tank F1-24 was used to store the recovered nitric acid for reuse in the Plant 2 extraction process.

HWMU Decontamination

The decontamination requirements needed to accomplish the remediation goals for the NAR System consistent with the RCRA/CERCLA Integration strategy are discussed in Section 3.5.3.3 of the Integrated RD/RA Work Plan.

The Nitric Acid Recovery System has been designated a HWMU because it was used to store nitric acid waste, characterized as D002 – corrosive and D007 – chromium, for greater than

ninety days. The HWMU boundaries are defined to encompass the areas where nitric acid was being stored in various tanks and weir boxes since cessation of operations in 1989.

Based on an evaluation of HWMU No. 10 conducted during remedial design, it has been determined that some components of the NAR System will not require further decontamination. As part of Removal Action #20, Uranyl Nitrate Hexahydrate Neutralization Project and the Nitric Acid/Residual Waste Project, Tanks F3E-220 and F1-24 were emptied and the contents were treated to meet RCRA land disposal restriction requirements. The tanks and associated piping were decontaminated in accordance with OEPA closure guidance standards. The analytical results for the decontamination rinseates were provided in the Removal Action Number 20 Final Report.

Additional hold-up material was removed from the NAR System during Safe Shutdown activities. However, some components of the NAR System, such as the weir boxes, were difficult to access and may still contain solid residues. A visual examination of these components will be conducted once they become accessible and any remaining hold-up material will be removed, containerized and dispositioned in accordance with regulatory requirements.

Decontamination of the remaining HWMU components (F3E-220, E3-210, E3-211, F3E-207, F3E-213, F3E-215, F3E-218, G3E-207), along with ancillary equipment such as pumps, piping, valves, and sensors of the NAR System, and the secondary containment area for Tank F1-24 will be achieved by rinsing each HWMU component and the secondary containment with a solution of potable water. A sample of the decontamination rinseate from each component (i.e., no composite sampling) will be collected and analyzed for pH and chromium to determine compliance with OEPA Closure Guidance standards. The decontamination rinseate will be managed per procedure EP-0005, "Controlling Aqueous Wastewater Discharges into the Wastewater Treatment System."

Following decontamination, the NAR System components will be dismantled, containerized, and dispositioned in the OSDF in accordance with the OSDF WAC. The Soil Characterization and Excavation Project will address the underlying soils and evaluate the concrete secondary containment area for Tank F1-24 and the floor of Plant 2 against WAC requirements for the disposal of this debris in the OSDF. The FEMP will conduct annual inspections of this unit until closure has been completed under the Integrated RCRA/CERCLA process. Certification for the completion of closure activities for HWMU No. 10 will be provided by SCEP.

HWMU No. 47:

Uranyl Nitrate Hexahydrate (UNH) Tanks (HWMU No. 47) consists of three outdoor, aboveground storage tanks located north of Plant 2. The three tanks, Tank F2E-5 (SE), F2E-6 (NE) and F2E-8 (SW), are constructed of stainless steel with a capacity of 25,265 gallons. The tanks are located inside a secondary containment area. This area measures approximately 63'6" by 40' 6" inches and is surrounded by a 2' 8" high dike. Both the floor and dike are constructed of concrete and acid brick coated with tar.

HWMU Decontamination

The decontamination requirements needed to accomplish the remediation goals for HWMU No. 47 consistent with the RCRA/CERCLA Integration strategy are discussed in Section 3.5.3.3 of the OU3 Integrated RD/RA Work Plan.

The three UNH tanks were designated a HWMU because they stored waste uranyl nitrate hexahydrate (UNH), a characteristically hazardous waste, for greater than ninety days. UNH has been characterized as D002 (corrosive), D005 (barium), D007 (chromium), D008 (lead) and D009 (mercury).

Based on an evaluation of HWMU No. 47 conducted during remedial design, it was determined that no further decontamination of the tanks and associated piping was required. Under Removal Action Number 20, Uranyl Nitrate Hexahydrate Neutralization Project, the tanks were emptied and the UNH was treated to meet RCRA land disposal restriction requirements. The tanks and associated piping were decontaminated in accordance with OEPA closure guidance standards. The analytical results for the decontamination rinseates were provided in the Removal Action Number 20 Final Report.

As a result, the tank structural support foundations and secondary containment area are the only remaining components that are required to be addressed as part of closure activities for this unit. The tank structural support foundations will be rinsed. In order to demonstrate compliance with OEPA closure guidance standards, a sample of storm water from the sump inside the secondary containment area will be collected and analyzed for corrosivity (pH), barium, chromium, lead, and mercury. If there is insufficient water in the sump to obtain a sample, the secondary containment area will be rinsed with a solution of potable water and a sample of the rinseate will be collected from the sump. The analytical results will be evaluated against OEPA closure guidance levels to verify that these standards have been achieved for this unit.

The tank and associated piping will be dismantled, containerized and disposed of in the OSDF in accordance with the OSDF WAC. The acid brick will be containerized and dispositioned off-site in accordance with the OU3 ROD for Final Remedial Action. The Soil Characterization and Excavation Project will evaluate the concrete secondary containment against WAC requirements for the disposal of this material into the OSDF. Certification for the completion of closure activities for HWMU No. 47 will be provided in the Project Completion Report for the Multi-Complex D&D project.

HWMU No. 49:

Uranyl Nitrate Hexahydrate (UNH) Tanks - Digestion Area (HWMU No. 49) consists of eight aboveground storage tanks. These tanks are located in two areas inside the Digestion Area in Plant 2.

- Tanks D1-1, D1-2, D1-4, F1-1 and F1-25 are cylindrical, stainless steel tanks located within a 20 ft. x 127 ft. area. The floor of this area is lined with acid brick and sloped for drainage. The capacity of Tanks D1-1, D1-2 and D1-4 is approximately 3,500 gallons. Tanks F1-1 and F1-25 have a capacity of 3,421 gallons and 23,543 gallons, respectively.
- Tanks D1-7, D1-10 and F1-26 are cylindrical, stainless steel tanks located within a 20 ft. x 127 ft. area. The floor of this area is lined with acid brick and sloped for drainage. The capacity of Tanks D1-7 and D1-10 is 3,625 gallons. Tank F1-26 has a capacity of 23,008 gallons.

HWMU Decontamination

The decontamination requirements needed to accomplish the remediation goals for HWMU No. 49 consistent with the RCRA/CERCLA Integration strategy are discussed in Section 3.5.3.3 of the OU3 Integrated RD/RA Work Plan.

The eight UNH tanks were designated a HWMU because they stored waste uranyl nitrate hexahydrate (UNH), a characteristically hazardous waste, for greater than ninety days. UNH has been characterized as D002 (corrosive), D005 (barium), D007 (chromium), D008 (lead), and D009 (mercury).

Based on an evaluation of HWMU No. 49 conducted during remedial design, it was determined that one tank, the tank ancillary equipment, and the two secondary containment areas are the only remaining components which are required to be decontaminated to complete closure activities for this unit. Under Removal Action Number 20, Uranyl Nitrate Hexahydrate Neutralization Project and the Nitric Acid/Residual Waste Project, Tanks D1-1, D1-2, D1-7, D1-10, F1-1, F1-25 and F1-26 were emptied and the UNH was treated to meet RCRA land disposal restriction requirements. The tanks and associated piping were decontaminated in accordance with OEPA closure guidance standards. The analytical results for the decontamination rinseates for these tanks were provided in the Removal Action Number 20 Final Report.

Tank D1-4 contained 2,100 gallons of UNH that was treated in 1992 as part of the initial testing of the UNH treatment process. The internal surface of this tank will be decontaminated using a solution of potable water. A sample of the rinseate will be collected and analyzed for corrosivity (pH), barium, chromium, lead and mercury to determine compliance with OEPA closure guidance levels. The tank ancillary equipment (e.g. pumps, piping and valves) will be decontaminated using a solution of potable water. A sample of the rinseate will be collected and analyzed for corrosivity (pH), barium, chromium, lead and mercury to determine compliance with OEPA closure guidance levels.

The two secondary containment areas will also be decontaminated using a solution of potable water. A sample of the decontamination rinseate from each area will be collected and analyzed for corrosivity (pH), barium, chromium, lead and mercury. The analytical results will

be evaluated against OEPA closure guidance levels to verify that these standards have been achieved for these components.

The eight UNH tanks and associated piping will be dismantled, containerized and disposed of in the OSDF in accordance with the OSDF WAC. The acid brick will be containerized and dispositioned off-site in accordance with the OU3 ROD for Final Remedial Action. The SCEP will determine if the concrete floor meets WAC requirements for disposition in the OSDF. Certification for the completion of closure activities for HWMU No. 49 will be provided in the Project Completion Report for the Multi-Complex D&D project.

Asbestos Removal

Standard asbestos abatement glovebag practices are planned for the removal of friable ACM piping identified in Table 2-2 for Building 2A. Friable ACM on tanks and large pieces of equipment will be removed inside negative pressure enclosures.

Surface Decontamination

Process debris is anticipated during equipment/systems dismantlement in this building. Prior to removing debris from Building 2A, all external and accessible internal surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain inaccessible internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, transite removal, and structural steel removal activities are planned for Building 2A. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work. Potentially mixed waste lead and acid brick were identified in the OU3 Integrated RD/RA Work Plan for this building. Both waste streams will be containerized for packaging and off-site disposition at a permitted commercial disposal facility.

3.2 Building 2B – General/Refinery Sump Control Building

Background

Building 2B (General/Refinery Sump Control Building) is a two-story building comprised of an older original building and a newer annex attached on the south side. The original building consists of a concrete first floor and metal diamond plate second floor; it was constructed with a structural steel frame and transite panels for the walls and roof. This part of Building 2B is approximately 39 ft. x 43 ft. The annex is approximately 20 ft. x 20 ft. with a concrete floor covered with floor tile on the first floor and only concrete on the second floor. The walls consist of structural steel and wall board. The ceiling on the first floor is metal decking, while the second floor has metal decking covered with fiberglass insulation. The building is located south of the General Sump (Component 18B) and the Refinery Sump (Component 3H) and north of the Bulk Lime Handling Building (Building 2C). Appendix D provides floor plan and elevation views for this component, while photographs are provided in Appendix E.

Process Area Description

In Building 2B, the magnesium oxide and lime were mixed with water to form a slurry and then transferred to the refinery sump operation. The slurry was used for precipitation of uranium compounds from process wastewater and storm-water runoff. The annex housed new laboratory facilities to support the refinery sump. The major media identified for Building 2B are the concrete floor and structural steel. Building 2B is constructed with transite panels.

Remedial Tasks

Four remedial tasks apply to Building 2B and are described below. There are no HWMUs in Building 2B.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility under Facility/Safe Shutdown.

Asbestos Removal

Standard asbestos abatement glovebag practices are planned for the removal of friable ACM identified in Table 2-2 for Building 2B. Friable ACM will be removed from tanks outside building 2B inside negative pressure enclosures.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Building 2B, all external surfaces and accessible internal surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain inaccessible internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, transite removal, and structural steel removal activities are planned for Building 2B. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work. Potentially mixed waste lead was identified in the OU3 Integrated RD/RA Work Plan for this building. This waste stream will be containerized for packaging and off-site disposition at a permitted commercial disposal facility.

3.3 Building 2C – Bulk Lime Handling Building

Background

Building 2C (Bulk Lime Handling Building) is a three-level building located immediately south of the Refinery Sump Control Building (Building 2B) and east of the Maintenance Building (Building 3A). The first and third levels of the building are rectangular, with dimensions of 17 ft. x 28 ft. x 10 ft. The second level consists of a steel silo that is 50 ft. tall and 18 ft. wide. Building 2C has a structural steel frame, transite siding and roofing, and a concrete foundation. A cement loading dock or pad for Building 2C is located east of the building.

Appendix D provides floor plan and elevation views for this component, while photographs are provided in Appendix E.

Process Area Description

Building 2C has one wet process area, bulk lime handling. The bulk lime handling process produced a lime slurry for several of the processes in the Ore Refinery Plant (Building 2A). Bulk lime (CaO), in the form of pebbles, was delivered via the truck loading dock to the building. A vacuum pump filled the silo with the lime. The silo released the lime proportionally to the lime slaker. The lime slaker mixed the lime with water to create a lime slurry. The slurry exited the lime slaker to the break tank for further agitating. When the slurry was completely mixed, it was pumped to a holding tank located immediately north of the building before being distributed to other process areas.

Remedial Tasks

Four remedial tasks apply to Building 2C and are described below. There are no HWMUs in Building 2C.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility under Facility/Safe Shutdown.

Asbestos Removal

Standard asbestos abatement glovebag practices are planned for the removal of friable ACM identified in Table 2-2 for Building 2C.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Building 2C, all external and accessible internal surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain inaccessible internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a

minimum of 1,000 psi, and surface wipe-downs are likely methods for removing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, transite removal, and structural steel removal activities are planned for Building 2C. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work. The silo will be sheared during structural demolition using water spray for dust control.

3.4 Building 2D – Metal Dissolver Building

Background

Building 2D (Metal Dissolver Building) is a two-story building located south of 2nd Street. Its shape is irregular, measuring approximately 39 ft. x 50 ft. and 20 ft. high. The building consists of a structural steel frame with transite panels for the roof and exterior walls and is situated on a poured concrete base. The first floor is concrete except for the acid brick located in the area previously occupied by the original metal dissolver and in the pit around the west and east metal dissolvers. A mezzanine, constructed of diamond plate, extends more than halfway across the building from the south wall. The structural steel, concrete, and acid brick are considered the major media for the component. Appendix D provides floor plan and elevation views for this component, while photographs are provided in Appendix E.

Process Area Description

The operations practiced in Building 2D used nitric acid solution to promote dissolution of uranium or other metal contaminants. Building 2D housed operations that digested or dissolved uranium-containing materials. Three dissolution processes have been identified in Building 2D: metal dissolution, west metal dissolution, and charcoal treatment.

Metal Dissolution: The metal dissolver tank received solid uranium scrap metal from the metal production plant (Building 5A). Top crops, derbies, slugs, and out-of-specification ingots and fuel rods were among the products received. The scrap metal was sprayed with nitric acid in the metal dissolver tank to dissolve the scrap uranium into uranyl nitrate (UNH). Temperature controls were used to optimize the performance of the nitric acid to reach the specified

concentration of 250 to 400 g/L U required before the solution was diverted to the digestion process in the Ore Refinery Plant (Building 2A). The nitric oxide fumes were routed through a condenser, and the acid was reformed. The nitric gases went through the Venturi fume scrubber and on to the NAR Towers (Component 3D). The metal dissolver tank was replaced in 1990 with a new tank, which was never used. The original metal dissolver tank was located in the southwestern section of Building 2D; the new metal dissolver tank is located in the north-central section. An electrical control room is also included as part of this process area.

West Metal Dissolution: The west metal dissolver tank received various end products from the Recovery Plant (Building 8A), primarily black oxides and calcium uranate. The west metal dissolver tank was filled with heated UNH solution from the digestion process in the Ore Refinery Plant. Additional nitric acid was added to dissolve the metal oxides. If fluorine was known to be present, alumina was also added to the solution. The solution was required to reach 200 g/L U for use as product solution.

Charcoal Treatment: Contaminated solvents from the extraction process in the Ore Refinery Plant were reclaimed through the charcoal treatment process. The spent material was composed of tributyl phosphate (TBP) and kerosene. The spent solvents were mixed with nitric acid in the east metal dissolver tank. Charcoal was added to adsorb the solvent contaminants. The resulting slurry was filtered through a small rotary drum vacuum filter located on the second floor. The filtrate was routed through an in-line carbon polishing system and reused. The filtered solids were disposed of in drums.

Remedial Tasks

Four remedial tasks apply to Building 2D and are described below. There are no HWMUs in Building 2D.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility. Safe shutdown activities also included the removal of all hold-up material within the equipment, piping and ductwork systems. Removal Action 12 - The Safe Shutdown Closeout

Report (DOE 1999) provides further information related to types and quantities of hold-up material removed from Plant 2/3 during Safe Shutdown.

Asbestos Removal

Standard asbestos abatement glovebag practices are planned for the removal of friable ACM identified in Table 2-2 for Building 2D.

Surface Decontamination

Process debris is not anticipated in this building due to the expectation that all process residues will be removed. Prior to removing debris from Building 2D, all external and accessible internal surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain inaccessible internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, transite removal, and structural steel removal activities are planned for Building 2D. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work. Potentially mixed waste acid brick was identified in the OU3 Integrated RD/RA Work Plan for this building. The acid brick will be containerized for packaging and off-site disposition at a permitted commercial disposal facility.

3.5 Component 2F – Cold Side Ore Conveyor

Background

Component 2F (Cold Side Ore Conveyor) provided a means for uranium ores and residues to reach the digestion process in the Ore Refinery Plant (Building 2A). It measures approximately 92 ft. x 24 ft. and sits on the Plant 2 West Pad (Component 74B). Though no longer functional, the following equipment remains: a drum conveyor, a bucket elevator, a drum

dumper, a screw conveyor, a conveyor shed, the Drum Dumper Building, and a 20-ft. deep elevator pit. Appendix D provides floor plan and elevation views for this component, while photographs are provided in Appendix E.

Process Area Description

The system was initially designed to handle drummed ores that contained very low levels of radium (referred to as "cold"). The drummed ores or residues were loaded onto the conveyor to be dumped into the bucket elevator system, which carried the material to the top floor of the Ore Refinery Plant for digestion in nitric acid.

Remedial Tasks

Four remedial tasks apply to Component 2F and are described below. There are no HWMUs in Component 2F.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility. Safe shutdown activities also included the removal of all hold-up material within the equipment, piping and ductwork systems. Removal Action 12 - The Safe Shutdown Closeout Report (DOE 1999) provides further information related to types and quantities of hold-up material removed from Plant 2/3 during Safe Shutdown.

Asbestos Removal

Standard asbestos abatement glovebag practices are planned for the removal of friable ACM identified in Table 2-2 for Building 2F.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Component 2F, all external and accessible internal surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain inaccessible internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing contamination.

Above-Grade Dismantlement

The major media for Component 2F include concrete and structural steel. The concrete for the component is only within the Drum Dumper Building; the concrete beneath the exterior conveyor is considered part of the Plant 2 West Pad. Equipment/system removal, masonry/concrete removal, and structural steel removal activities are planned for Component 2F. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.6 Component 2H – Conveyor Tunnel (From Plant 1)

Background

Component 2H (Conveyor Tunnel from Plant 1) houses a subgrade conveyor. The approximate dimensions of the conveyor trench are 15 ft. x 190 ft. and 5 ft. deep. Component 2H extends from the former Plant 1 Ore Silos (Component 1C) to the Ore Refinery Plant (Building 2A). Component 2H was intended to transport milled uranium ores to the Ore Refinery Plant; this operation was aborted in 1955. Appendix D provides floor plan and elevation views for this component, while photographs are provided in Appendix E.

Process Area Description

Component 2H contained one dry process area, the Ore Conveyor. Component 2H housed the Ore Conveyor process, which was intended to transport milled uranium ores underground from the Plant 1 Ore Silos to the Ore Refinery Plant. The conveyor system had a problem with accountability of uranium and was aborted.

Remedial Tasks

Three remedial tasks apply to Component 2H and are described below. There are no HWMUs in Component 2H and no record of friable asbestos.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility. Safe shutdown activities also included the removal of all hold-up material and ores within the conveyor tunnel. Removal Action 12 - The Safe Shutdown Closeout Report (DOE 1999)

provides further information related to types and quantities of hold-up material removed from Plant 2/3 during Safe Shutdown. Additional facility shutdown removal work has been planned to remove the conveyor equipment prior to the Multi-Complex D&D project should sufficient funding be made available. Such activity would remove any further D&D work on this component by the D&D contractor.

Surface Decontamination

Process debris is not anticipated in this component. All external and accessible internal surfaces will be cleaned to remove gross removable surface contamination and any equipment showing inaccessible internal contamination will be sealed or encapsulated.

Above-Grade Dismantlement

The major media for Component 2H are concrete and steel. The trench, which housed the conveyor, was constructed of concrete. The trench was covered with a steel plate. Equipment/system removal is the only dismantlement activity planned for Component 2H. Manual dismantlement methods are anticipated for removal of the conveyor equipment/systems. Removal of equipment/systems will likely take place at the south or north tunnel access points rather than removing the asphalt and metal plate on 2nd Street. The concrete will be left in place for below-grade dismantlement by the Soil Excavation contractor.

3.7 Building 3A – Maintenance Building

Background

Building 3A (Refinery Maintenance Building) is a single story building located just north of 101st Street and west of the Bulk Lime Handling Building (Building 2C). The building is square, measuring 60 ft. x 60 ft. and 14 ft. high. Building 3A has a structural steel frame, transite panels covering cinder block walls, and a concrete floor. The building has one room and some office space. Two small steel-grate mezzanines provide storage for motors and pumps. Appendix D provides floor plan and elevation views for this component, while photographs are provided in Appendix E.

Process Area Description

Building 3A is the maintenance facility for the Ore Refinery Plant (Building 2A). The building was used to repair various equipment used in the Ore Refinery Plant, including pumps and motors. Among the tasks performed on the equipment were welding and electrical work. Solvents and oils were frequently used throughout the building. Tools and spare parts, required to repair and maintain the equipment, were also stored in Building 3A. Only one process area is identified for the building; because of the use of degreasing solvents in the maintenance activities, the process was considered wet.

Remedial Tasks

Four remedial tasks apply to Building 3A and are described below. There are no HWMUs in Building 3A.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility. Safe shutdown activities also included the removal of all hold-up material within the equipment, piping and ductwork systems. Removal Action 12 - The Safe Shutdown Closeout Report (DOE 1999) provides further information related to types and quantities of hold-up material removed from Plant 2/3 during Safe Shutdown.

Asbestos Removal

Standard asbestos abatement glovebag practices are planned to remove the friable ACM identified in Table 2-2 for Building 3A.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Building 3A, all external and accessible internal surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain inaccessible internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, transite removal, and structural steel removal activities are planned for Building 3A. Hydraulic shear technology will likely be used for structural steel and manual dismantlement methods (e.g., portaband sawing, torch cutting) are anticipated for most internal equipment/system removal work. Above-grade cinderblock walls will likely be removed by use of hoe ram or shears while liberally spraying surfaces with water to minimize airborne dusts.

3.8 Building 3B – Ozone Building

Background

Building 3B (Ozone Building) is a rectangular, single story building which measures 27 ft. x 33 ft. x 14 ft. high. The building is comprised of a steel frame on a poured concrete foundation floor and has transite panel walls and roof. Appendix D provides floor plan and elevation views for this component, while photographs are provided in Appendix E.

Process Area Description – Building 3B originally housed the equipment that generated ozone for use in bleaching the nitric acid from the NAR system. The equipment was removed prior to 1975.

Remedial Tasks

Three remedial tasks apply to Building 3B. There are no HWMUs in Building 3B and there is no friable asbestos.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility. Safe shutdown activities also included the removal of all hold-up material within the equipment, piping and ductwork systems. Removal Action 12 - The Safe Shutdown Closeout Report (DOE 1999) provides further information related to types and quantities of hold-up material removed from Plant 2/3 during Safe Shutdown.

Surface Decontamination

Surface decontamination will be performed as described in Section 2.5.5 of this plan.

Above-Grade Dismantlement

The following dismantlement activities will occur in accordance with Section 2.5.3:

- The transite panels will be encapsulated, removed and packed on pallets in accordance with the specifications in Appendix C. Structural steel will be dismantled using mechanical means such as cutting.
- Materials that will be generated during the dismantlement of Component 3B include piping and conduit, structural and miscellaneous steel, doors, windows and exterior transite paneling.

3.9 Building 3C – NAR Control House

Background

Building 3C (Nitric Acid Recovery Control House) is a single-story building located just north of 101st Street and west of the Maintenance Building (Building 3A). The building is rectangular, with approximate dimensions of 26 ft. x 110 ft. and 14 ft. high. Building 3C is constructed with a structural steel frame and transite panels on a poured concrete base. The interior of the building is divided into several rooms for administrative operations. The administrative areas have vinyl floor tile covering the concrete floor. Building 3C houses the electrical control panels for the NAR Towers (Component 3D). This building also contains an office, conference room, and breakroom. Appendix D provides floor plan and elevation views for this component, while photographs are provided in Appendix E.

Process Area Description

Building 3C has one dry process area: NAR control. The NAR control process area occupies only a fraction of the space in the building. Most of the space is used for administrative purposes. The NAR control process involves the operation of the electrical control panels that control the NAR system. The NAR system used a closed-loop design that consists of a series of tanks, pumps, and transfer lines to recover nitric acid from digestion processes in and around the Ore Refinery Plant (Building 2A).

Remedial Tasks

Four remedial tasks apply to Building 3C and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility. Safe shutdown activities also included the removal of all hold-up material within the equipment, piping and ductwork systems. Removal Action 12 - The Safe Shutdown Closeout Report (DOE 1999) provides further information related to types and quantities of hold-up material removed from Plant 2/3 during Safe Shutdown.

Asbestos Removal

Standard asbestos abatement glovebag practices are planned for the removal of friable ACM identified in Table 2-2 for Building 3C.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Building 3C, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, transite removal, and structural steel removal activities are planned for Building 3C. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.10 Component 3D – NAR Towers

Background

Component 3D (Nitric Acid Recovery Towers or NAR Towers) is a six-level open steel supported structure that is approximately 46 ft. x 60 ft. and 60 ft. high. The ground floor of the structure is contained in a concrete diked area that is approximately 70 ft. x 108 ft. The concrete dike is not covered with acid brick. The upper five levels have steel plating as flooring. Component 3D is located north of the NAR Control House (Building 3C) and the Ozone Building (Building 3B). Appendix D provides floor plan and elevation views for this component, while photographs are provided in Appendix E.

Process Area Description

Component 3D was part of a closed-loop system designed to recover nitric acid. The system consisted of two absorber towers in which nitrogen oxide fumes were drawn through a series of bubble cap trays. The fumes were collected from the Metal Dissolver (Component 2D) and from the digestion and denitration processes in the Ore Refinery Plant (Component 2A). Nitric acid was recovered for reuse in the Ore Refinery Plant. The system was shut down in 1988.

Remedial Tasks

Four remedial tasks apply to Component 3D and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility. Safe shutdown activities also included the removal of all hold-up material within the equipment, piping and ductwork systems. Removal Action 12 - The Safe Shutdown Closeout Report (DOE 1999) provides further information related to types and quantities of hold-up material removed from Plant 2/3 during Safe Shutdown.

Surface Decontamination

Process debris is in the ductwork on the top level. Prior to removing debris from Component 3D, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the

removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, transite removal, and structural steel removal activities are planned for Component 3D. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work. Some stainless steel tanks may be size reduced using arc cutting torches with local HEPA ventilation.

3.11 Building 3E – Hot Raffinate Building

Background

Building 3E (Hot Raffinate Building) is a three-story building located north of 2nd Street. Its shape is irregular, measuring approximately 50 ft. x 90 ft. and 60 ft. high at its greatest dimensions. The building consists of a structural steel frame with a poured concrete base. Heavy concrete walls and double-pane water-filled windows protected operators from being exposed to radiation from high-radium raffinate streams. Building 3E housed one process referred to as "filtration", which used a combination of several filters, pumps, and tanks.

Process Area Description

Building 3E housed a system of tanks, pumps, and filters that were used to filter insolubles from raffinate solutions, uranyl nitrate solutions (UNH), and slag leaching solutions.

Remedial Tasks

Five remedial tasks apply to Building 3E and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility. Safe shutdown activities also included the removal of all hold-up material within the equipment, piping and ductwork systems. Removal Action 12 - The Safe Shutdown Closeout Report (DOE 1999) provides further information related to types and quantities of hold-up material removed from Plant 2/3 during Safe Shutdown.

Hazardous Waste Management Unit Decontamination

The decontamination of HWMU No. 50, UNH Tanks, Hot Raffinate Building, was performed under an accelerated HWMU Closure project in the fall-winter of 1998-99. The performance of this activity successful and was documented in the Project Completion Report for Decontamination of HWMU No. 50 – UNH Tanks, Hot Raffinate Building (DOE 1999c), which was approved regulatory agencies in March 1999.

Asbestos Removal

Standard asbestos abatement glovebag practices are planned for the removal of friable ACM identified in Table 2-2 for Building 3E.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Building 3E, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, transite removal, and structural steel removal activities are planned for Building 3E. Hydraulic shear technology will likely be used for structural steel, concrete walls and some equipment/system removal work. Some stainless steel tanks may be size reduced using arc cutting torches with local HEPA ventilation.

3.12 Component 3H – Refinery Sump

Background

Component 3H (Refinery Sump) provided treatment of contaminated effluents from the Ore Refinery Plant (Building 2A) with MgO (magnesium oxide) to precipitate uranium. It is located south of the General Sump (Component 18B) and west of B Street. The Refinery Sump

consists of six tanks and is located outside in an acid brick containment area measuring 55 ft. x 100 ft. Component 3H major media include the acid brick, concrete from the containments, and the steel from the tanks.

Process Area Description

Effluent from the Ore Refinery Plant was transferred to Component 3H to be treated. The effluents were treated with MgO to precipitate the uranium. The MgO was slurried with water in the General/Refinery Sump Control Building (Building 2B) for use in the process. The treated Refinery Sump effluents were transferred to the adjacent General Sump for further treatment. The recovered uranium (as cake slurry) was recycled through the digestion area of the Ore Refinery Plant. Several of the tanks stored uranyl nitrate (UNH) but was removed and processed for disposal.

Remedial Tasks

Four remedial tasks apply to Component 3H and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility. Safe shutdown scope during the Plant 2/3 shutdown project did not include any hold-up removal from Building 3H; however, the Aquifer Restoration Wastewater Project performed operations shutdown in Spring 2000 by removing process residues and disposition of inventory and materials.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Building 3H, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, and structural steel removal activities are planned for Building 3H. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work. Above-grade cinderblock walls will likely be removed by use of hoe ram or shears while liberally spraying surfaces with water to minimize airborne dusts. Acid brick, which was not identified in the OU3 RI/FS as potentially mixed waste, will be containerized for off-site disposition at the NTS.

3.13 Component 3J – Combined Raffinate Tanks

Background

Component 3J (Combined Raffinate Tanks) is a multilevel open tank farm area measuring 39 ft. x 169 ft. and 20 ft. high. Beneath the tanks is a concrete pad and dike covered with acid brick. Structural steel is used as the structural support for the 17 vertical tanks and the stairs and catwalks. The component is located north of the Hot Raffinate Building (Building 3E) and west of the NAR Towers (Component 3D).

Process Area Description

Component 3J received raffinates and slag leach filtrates and concentrated them by evaporation for reprocessing in the Ore Refinery Plant (Building 2A). Spent Zirnlo acid (high levels of copper digested in hydrofluoric acid) was transferred to the combined raffinate tanks from portable dumpsters from the Plant 9 Zirnlo process for use in this process.

Remedial Tasks

Four remedial tasks apply to Component 3J and are described below. There are no HWMUs in Component 3J.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility. Safe shutdown activities also included the removal of all hold-up material within the equipment, piping and ductwork systems. Removal Action 12 - The Safe Shutdown Closeout Report (DOE 1999) provides further information related to types and quantities of hold-up material removed from Plant 2/3 during Safe Shutdown.

Surface Decontamination

Process debris is not anticipated in this component. Equipment/systems associated with this component appear amenable to removal of any internal process residues. Prior to removing debris from Component 3J, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, and structural steel removal activities are planned for Component 3J. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work. Acid brick, which was not identified in the OU3 RI/FS as potentially mixed waste, will be containerized for off-site disposition at the NTS.

3.14 Component 3K – Old Cooling Water Tower

Background

Component 3K, the Old Cooling Water Tower, was a one story, redwood structure with dimensions of 30 ft. x 50 ft. It was located at the intersection of A Street and 101st Street. The wooden tower was removed during FEMP production, leaving an at grade and below-grade structure consisting of a concrete basin and a diked pad. No floor plan exists for this facility.

Process Area Description

Component 3K consists of a single, wet process referred to as process water cooling. Component 3K provided process water cooling for the Harshaw system. A redwood cooling tower provided process water to cool four of the towers of the Harshaw System (Component 3F). This system was replaced by the Refrigeration Building (Component 3G) in the mid-1960s.

Remedial Tasks

One remedial task applies to the remains of Component 3K. Utilities, hold-up material, inventory material, or asbestos are not present in this component. There is a small asbestos insulated vessel still present at this location.

Above-Grade Dismantlement

Component 3K has a concrete basin topped with gravel and a diked pad that houses six thin, steel manhole covers. A trackhoe excavator or small Bobcat-type loader may be used along with manual methods to remove concrete/masonry. Metal sump/pump equipment will likely be removed by manual methods.

3.15 Building 3L – Electrical Power Center Building

Background

Building 3L (Electrical Power Center Building) is a single-story building measuring approximately 24ft. x 91 ft. and 10 ft. high and consisting of a concrete floor and structural steel frame with transite siding and roof. The building contains electrical meters, panels, and main circuit breakers. The building is attached to the north side of the Maintenance Building (Building 3A). The major media identified for Building 3L are the concrete floor, structural steel, and cinder block breakroom walls.

Process Area Description

Building 3L serves as a secondary unit substation that received 13.2 kV and transformed it down to 480 V. The electricity powered general-use equipment, including lighting, receptacles, and miscellaneous equipment in the Ore Refinery Plant (Building 2A) and the Recovery Plant (Building 8A). Inside the building is a cinder block room that was used as a breakroom. The function as an electrical substation will continue throughout most of the Multi-Complex D&D project due to service needs beyond the project scope. D&D of Building 3L will take place late in the project schedule.

Remedial Tasks

Four remedial tasks apply to Component 3L and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections will be performed on this facility prior to being released for demolition. This facility currently served power to demolition operations in the southwest quadrant of the FEMP former Production Area. Hold-up materials are not present. Radiological surveys indicate that gross decontamination is not necessary prior to turnover to the D&D Contractor.

Asbestos Removal

Standard asbestos abatement glovebag practices are planned for the removal of friable ACM identified in Table 2-2 for Component 3L.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Building 3L, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, transite removal, and structural steel removal activities are planned for Building 3L. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.16 Building 8A – Recovery Plant

Background

Building 8A (Recovery Plant), a two-story structure measuring 239 ft. x 280 ft. and 37 ft. high, is located on the south side of 101st Street between A and B streets. The building consists of a structural steel frame on a reinforced poured concrete foundation, reinforced concrete ground floors, transite interior and exterior siding panels (insulation material between panels), and transite roof panels. The second floor is primarily steel grating with some concrete flooring. Building 8A is attached to the new Rotary Kiln/Drum Reconditioning Building

(Building 8C), which is south of Building 8A. Building 8A converted uranium-containing residues and off-specification and scrap uranium metal to more suitable chemical forms for recycling to the production process in the Ore Refinery Plant (Building 2A). The materials processed for recovery in Building 8A included mostly metal chips and turnings, off-specification green salt from the Hydrofluorination Plant (Building 4A), dust collector residues, and sump cakes.

Process Area Description

Building 8A contains 16 current and/or historical process areas, some of which hosted two or more processes during the history of the plant. The Recovery Plant consists of 16 process areas, some of which contain or contained more than one process unit during the history of Building 8A.

Oxidation Furnace No. 1: The oxidation furnace no. 1 is located near the east end of Building 8A, along the north wall. It is a six-hearth, refractory-brick-lined, industrial furnace that operated from the mid-1950s through 1987. The furnace is 54 inches in diameter and 25 ft. high. Oxidation furnace equipment included a drum dumping station, from which the feed material was transported to the furnace via a flexible screw conveyor that discharged into the top hearth. Drop holes allowed the feed material to fall from one rotating hearth to another. Product exiting the furnace was discharged from the sixth hearth into a water-cooled screw, conveyed to a bucket elevator, and then lifted and dropped into the drum packaging station.

Several types of enriched uranium feed materials were processed through oxidation furnace no. 2, including dust collector sludges, materials such as green salt with magnesium oxide from the Green Salt Plant, and off-specification uranium from various production plants. These materials were converted to calcium uranate for reprocessing through the Ore Refinery Plant.

A Wheelabrator dust collector and a scrubber system provided treatment of dust and off gases from oxidation furnace no. 2. The Wheelabrator unit collected dust from the furnace product drumming station and feed drum dumping station. The dedicated scrubber system was a venturi scrubber using 10 percent caustic (sodium hydroxide) as the scrubber solution for off gases from the furnace vents.

Oxidation Furnace No. 2: The oxidation furnace no. 2 was installed in 1953 in the southeastern corner of Building 8A. It is a six-hearth, refractory-brick-lined, industrial furnace used periodically until 1988 for the recovery of enriched uranium material and the treatment of depleted uranium waste. This furnace has the same design as the oxidation furnace no. 2. Enriched uranium scraps from several production plants were oxidized to black oxide in furnace No. 2, screened by rotexing, and then reintroduced into the production process at the Ore Refinery Plant. Alternatively, depleted uranium waste was oxidized and/or dewatered for volume reduction and free water removal before packaging for transport to disposal or storage. Besides uranium in varying levels of enrichment, some of the materials fed to the oxidation furnace in these operations contained RCRA-listed chlorinated solvents; therefore, the equipment has been identified as an HWMU (HWMU No. 15). A dust collector and a scrubber system treat the dust and off-gas streams from the furnace. The dust collector provided ventilation for the drumming station, which received collector dust discharges, and the product drumming station. The scrubber system was a dedicated venturi scrubber that used water as the scrubbing solution and received off gases directly from the furnace vents.

Graphite Furnace: Installed in 1953, the graphite furnace was used for only about three months in early 1960 and was completely removed. The 2-ft. wide, 10-ft. long furnace was a moving hearth (chain grate) gas-fired furnace used for processing contaminated graphite. This graphite was mostly furnace crucibles that were jaw-crushed in the Metals Production Plant (Building 5A), as well as select feed material, processed for the recovery of black oxide.

Muffle Furnace: The muffle furnace is a single-hearth furnace built in the 1950s, used during the 1980s only for a three-week test period in 1983, and closed in-place in 1985. The unit design was a refractory-brick-lined, steel hearth capable of both forward and reverse rabbling, 8.5 ft. in diameter and 20 ft. in height. The furnace was operated with variable retention times to obtain complete oxidation of the feed material. Materials fed to the furnace during the 1983 test included enriched off-specification green salt and filter cake with a high lime content. Upon completion of the test, the furnace was run to "dead bed," thereby recovering the end product, calcium uranate. This material was returned to the production operation in the Ore Refinery Plant.

A scrubber system and two Amerjet dust collectors handled off gases and dust generated by muffle furnace operation. One dust collector controlled dust from the furnace feed drum dumping station, one of three access doors to the furnace hearth, and the dust drumming station beneath the dust collector itself. The other dust collector controlled dust from the two remaining furnace hearth access doors, the furnace product drumming station, and the dust drumming station for the scrubber itself. The dust collectors were removed in 1991. The Amerjet collectors use filter bags that, when spent, were processed through the box furnace. The scrubber for off gases from the muffle furnace was also used for the primary calciner. The scrubber was a venturi unit using, at different times, either water or 10 percent caustic for the scrubber solution. A holding tank collected scrubber solutions that passed through the venturi to allow reuse of the water and chemical. This scrubber system was dismantled and removed in 1991.

In the summer of 1998, a surface concrete removal technology demonstration took place on the first floor of the Muffle Furnace Area. Approximately 1,464 square feet of the 1,611 square feet of the first floor had at least the top inch of concrete removed and packaged for off-site disposal (DOE 1998). Additional surface concrete must be removed and the requirements for that activity are described in the subsection for surface decontamination.

Box Furnace: The box furnace is a single, gas-fired furnace located outside Building 8A, immediately adjacent to the north wall of the building next to the muffle furnace. The box furnace is constructed of angle iron and sheet metal and is lined with refractory brick. It was installed in the mid-1950s and operated intermittently for more than 30 years, converting scrap uranium into black oxide and burning other contaminated materials into ash suitable for reprocessing in the Ore Refinery Plant. The box furnace operation was relatively simple, with batch feeding, manual rabbling, and hand raking of ash into product drums. Scrap materials fed to the box furnace included off-specification uranium and thorium tetrafluoride, dirty prill, off-specification uranium derbies from the Metals Production Plant, high-uranium-content mill cleanout from the Preparation Plant (Building 1A), and partially oxidized metal oxidation feed. Contaminated materials included rags, filters, cloth, paper, and other burnable trash containing uranium; dust collector bags from air pollution control equipment; and Rockwell smelting furnace cleanings from the Metals Production Plant. A dedicated venturi scrubber system handled off gases from the box furnace. Water was the scrubbing solution; a holding tank

near oxidation furnace no. 1 collected used scrubber water for reuse and solids settling. The box furnace is classified as a HWMU (HWMU No. 14).

Green Salt and Thorium Tetrafluoride Reversion: The green salt reverter was a horizontal, electrically heated, ribbon flight retort reactor used to revert scrap green salt to black oxide. Only operated for green salt reversion from 1956 to 1958, the reverter used superheated steam flowing countercurrent to the green salt feed material. The reverter unit was used for six months in 1966 to process 59 metric tons of thorium tetrafluoride and produce thorium hydroxide, with hydrofluoric acid as a by-product. The green salt reverter was equipped with a dust collector and scrubber; all of this equipment has been removed.

Old Rotary Kiln: The old rotary kiln is located in the southeastern part of Building 8A and operated from 1952 to 1989. It is a 5.5-ft. diameter, rotating steel cylindrical kiln and is lined with refractory brick. The kiln was used for the drying, roasting, and oxidation of recoverable materials, which were fed to the unit by a second-floor feed dumping station located at the west end of the kiln. The end products containing recoverable uranium exited the east end of the kiln at the first-floor product drumming station and were reused as feed stock in the Ore Refinery Plant. The old rotary kiln also treated waste by volume reduction (dewatering) before shipment off-site.

The old rotary kiln was equipped with both a dust collector and a scrubber system. The dust collector was configured to collect particulate emissions from the drum dumper, feed tray, breach chamber, and drum packaging station of the kiln as well as the primary calciner. The dust was handled either as recovered feed material for the Ore Refinery Plant or waste, depending on uranium levels. The dust collector has been removed. The scrubber system was similar to those discussed for other process areas in Plant 8.

The materials fed to the old rotary kiln consisted of a large variety of uranium and thorium process materials, including sump cakes, magnesium fluoride, machining chips and turnings, and thorium oxide, oxalate, and hydroxide. Dry material feeding was by screw conveyor, while wet feeding was by manual raking from a drum dump tray. Kiln products could be conveyed to a silo on the Plant 8 East Pad (Component 74C), which has been removed, in addition to being packed in drums.

Ball Mill: The ball mill was located on the east end of the first floor of Building 8A and was used for milling scrap uranium residues to facilitate dissolution in hydrochloric acid digesters. The ball mill has been removed. Two principal feeds to the ball mill, magnesium fluoride and crushed carbonate salts, were raked into the mill feed chute for wet milling (with water from a recycle tank) to a slurry that was transferred to a digester by pumping.

Primary Calciner: The primary calciner, installed in 1953, is located on the east side of Building 8A. Operated intermittently until 1989, the calciner consists of an eight-hearth, gas-fired industrial furnace with poured concrete hearth decks and an automatic rabble. The unit is 13.5 ft. in diameter with a refractory-lined steel shell. The primary calciner was used for drying and roasting of recoverable uranium and thorium residues and wastes, but it was used exclusively for wastes processing after 1985. Many of the feeds were the same as were fed to the old rotary kiln; some of the post-1985 wastes dried in the primary calciner included slag leach cake, neutralized raffinate, and sump cake from the Eimco filter in the water treatment/filtration process. The primary calciner has a dust collector that also served the old rotary kiln, as described above. The scrubber system for the primary calciner was shared with the muffle furnace.

Rotex Screening: The vibrating rotex screening unit is located west of the primary calciner and spans both the first and second floors in Building 8A. The rotex screening unit operated intermittently from the mid-1950s to 1989, separating particles of reclaimed and waste material that are larger than 8 mesh from those smaller than 8 mesh. The latter was shipped to the Ore Refinery Plant, while the former was incinerated in Building 8A. An additional use of the rotex unit was for repackaging both recyclable and waste materials into drums. Airborne emissions from the rotex screen were handled in a dust collector situated in the penthouse area on the roof of Building 8A. This unit uses filter bags, which have been placed on the unit since the rotex screen was shut down. During routine operation, collector residues were reprocessed in the Ore Refinery Plant, sent to the Plant 8 Old Metal Dissolver Pad (Component 74Q), or drummed as waste for disposal off-site.

Williams Crushing Hammer Mill: The Williams crushing hammer mill is located on the first floor of Building 8A, between the old rotary kiln and oxidation furnace no. 1 process areas and was taken out of service in the 1960s. The Williams unit (also known as a slugger crusher) was

designed for both wet and dry crushing of materials up to 6 inches in diameter. Feed materials were introduced into the mill via the drum dumper. Materials such as magnesium fluoride, sludge, contaminated graphite, incinerator ash, furnace salts, and dust collector sludges were reduced to fractional sizes of plus 0.5 inches and minus 0.5 inches Williams mill products were drummed and transferred to the digesters in the hydrometallurgical system for uranium recovery processing. The Williams unit is equipped with blowers, ductwork, and a cyclone separator for dust control. Presumably, the air discharge from the cyclone vented to the atmosphere above the roof of Building 8A.

Oil Centrifuge: The oil centrifuge was located next to the uranyl ammonium phosphate (UAP) furnace and was intended to remove solids from waste oil for use as fuel for the UAP furnace. Contaminated waste oil was first held in a decant tank to remove water and then passed through the centrifuge and stored in two large storage tanks. The tanks were located on a diked concrete pad south of Building 8A. The centrifuged waste oil was never used in the UAP furnace and the centrifuge and tankage have been removed.

Hydrometallurgical System, WINLO, and Water Treatment/Filtration: This process area covers roughly the northwestern two-thirds of Building 8A and contains or contained most of the wet processing units for scrap recovery and water/wastewater treatment.

Hydrometallurgical System: The hydrometallurgical system was the wet processing system for uranium recovery from milled, crushed, and rotexed low-grade residues. Two processes, known as the ammonium diuranate (ADU) and UAP processes, were used and consisted generally of digestion (dissolution), precipitation, filtration, and wastewater neutralization. The UAP process, used from 1958 to 1967, consisted of digestion of the residues with hydrochloric acid in the five digestion tanks (D101 through D105) on the first floor and filtration of the slurry through the two Eimco filters, which are rotary drum vacuum filters precoated with diatomaceous earth that are located on the second floor. The filter cake (tailings) was discarded to waste pits west of the production area, while the uranium-bearing filtrate was pumped to precipitation tanks that received ammonium hydroxide and phosphoric acid feeds. The resultant slurry, containing precipitates of UAP, was filtered on two Oliver precoat rotary drum vacuum filters located on the second floor south of the digestion tanks. The UAP cake was sent to the UAP furnace for drying, while the Oliver filtrate was neutralized

with caustic or lime, filtered again on the Oliver filters, and pumped to the General Sump (Component 18B). The UAP Oliver filters have been removed, while most of the rest of the UAP process units and tanks are still in place and either in use for water treatment or abandoned in place. Heels containing solids from the plant 6 perched water system building washdowns and "F" wastes remain in a 6,000 gallon inlet tank and a 500 gallon outlet tank.

The ADU process, used from 1955 to 1957 and again from 1967 to 1971, employed two tanks located on the second floor and west of the Oliver filters that are situated along the north wall of Building 8A. The filtered digestion liquor was heated and reacted with ammonium hydroxide to precipitate ADU, which was filtered on the west Oliver filter. The ADU cake was then sent to the UAP furnace, and the filtrate was treated as described above for the UAP process.

WINLO Process: From 1962 to 1964, the WINLO process was operated as a means of returning relatively pure, high-assay uranium materials to the Green Salt Plant. Black oxide from the furnaces and UAP and metal dissolver liquor were dissolved in hydrochloric and nitric acids and filtered on the Eimco filters. The filtrate containing uranium was then treated with 30 percent hydrofluoric acid, copper sulfate, and sulfur dioxide. The resultant green salt precipitate was filtered on a horizontal pan filter, passed through a dryer, and sent to the Green Salt Plant for further processing. Filtrate from the pan filter was neutralized with lime slurry and pumped to a waste settling pit. All related equipment (except the Eimco filters) and tankage, including a sulfur dioxide gas tank north of Building 8A, have been removed.

Water Treatment/Filtration: This process served as a wastewater treatment system for the site, including storm water, process water, and perched water. Wastewater streams were pumped into the digesters, where hydrated lime was added for neutralization, and the wastewater was then filtered through the Oliver filters. The filtrate was transferred to holding tanks on the north side of the Recovery Plant before being pumped to the General Sump. The Oliver filter cake was drummed and sent to the old rotary kiln or primary calciner for drying. An exception to the above process scheme for wastewaters from other plants is the handling of raffinate sump water from the Ore Refinery Plant during the 1980s. This raffinate sump water was transferred to Building 8A for the recovery of recyclable material and handled by first segregating the stream in holding tanks. Then the wastewater was treated with caustic

at a pH of 10 to 11. The treated wastewater was filtered on the east Eimco filter, and the filtrate was analyzed for uranium, copper, and pH. The filtrate was pumped to the General Sump if it proved to be in-specification. Wastewaters from the building were collected mostly in the main floor sump, except for the spent scrubber solutions and a few small diked and sump areas on the second floor, which were pumped directly from their points of generation. From 1955 through 1971 when the hydrometallurgical processes were in operation, these wastewaters were neutralized with caustic in a neutralization tank. After 1971, the wastewaters were treated in the digester tanks, filtered, sampled, and discharged to the General Sump like the other plant wastewaters.

The Plant 8 perched water treatment unit was situated in the northwestern corner of Building 8A. The system operated under the requirements of a CERCLA removal action. This particular area was not used during the historical operating period of Building 8A according to available plant records.

UAP Furnace: The UAP furnace was a 6-hearth, gas-fired furnace located west of the old rotary kiln along the south wall of Building 8A. As discussed above, the UAP furnace was used to dry UAP and ADU filter cakes from hydrometallurgical processing of residues. The UAP furnace had a dust collector but apparently not a scrubber system. The furnace and dust collector have been removed.

Thorium Storage Silo: Thorium compounds recovered in Building 8A processes were stored in an elevated steel silo located on the Plant 8 East Pad (Component 74C). The southeastern corner of the old rotary kiln area was the feed point for a conveyor that transferred the thorium materials outside to a bucket elevator. A raised conveyor system distributed the material for top entry into the silo. The silo and the conveyor/elevator system were removed in 1988.

Bulk Storage Tanks: Four bulk storage tanks were located north of Building 8A within diked concrete containment areas with small corner sumps. Three horizontal cylindrical steel tanks currently occupy a location east of the filtrate tanks and the Plant 8 North Pad (Component 74R). Two of the tanks are 17,000 gallons each and provide bulk storage for caustic. The third is a 12,250-gallon sodium oxalate storage tank and is marked. Historically, this area was

used for the bulk storage of phosphoric acid and sulfur dioxide. The phosphoric acid tank is now being used as the sodium carbonate tank. The sulfur dioxide tank has been removed.

Remedial Tasks

Five remedial tasks apply to Building 8A and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility. Safe shutdown activities also included the removal of all hold-up material within the equipment, piping and ductwork systems. Removal Action 12 - The Safe Shutdown Closeout Report (DOE 1999) provides further information related to types and quantities of hold-up material removed from Plant 8 during Safe Shutdown.

Hazardous Waste Management Unit Decontamination

There are two HWMUs associated with Plant 8: HWMU No. 14 (Box Furnace) and HWMU No. 15 (Oxidation Furnace #1). Descriptions and above-grade closure provisions for these HWMUs are detailed below.

HWMU No. 14:

The Box Furnace is a former treatment unit located outside and north of Plant 8, on Pad 74R. The furnace structure consists of an 18 ft. x 14 ft. unit, constructed of angle iron and sheet metal lined with refractory brick. The unit was gas-fired by a single burner. The Box Furnace was used to convert scrap uranium into uranium oxide. The furnace was also used to convert other process materials into ash that would be suitable for reprocessing. Waste materials processed for incineration included:

- cake clean-outs from Hilco Oil Recovery;
- chips in concrete from off-site;
- dust collector bags containing MgF_2, U_3O_8, and UO_3;
- magnesium fluoride with high free metal;
- metals containing metl-x;
- non-briquettable chips;
- Rockwell spills;
- saw chips;

- scrap UO_2 pellets;
- waste Merco Dri; and
- waste rags, paper, and polyethylene.

HWMU Decontamination:

The decontamination requirements needed to accomplish the remediation goals for the Box Furnace consistent with the RCRA/CERCLA Integration strategy are discussed in Section 3.5.3.3 of the Integrated RD/RA Work Plan.

The Box Furnace has been designated a HWMU because it was used to burn rags and gloves covered with spent 1,1,1-trichloroethane, tetrachloroethene, trichloroethene, listed hazardous waste (F001/F002). Other constituents of concern associated with the Box Furnace are barium, chromium, lead, and silver.

Decontamination of the Box Furnace will require disassembly of the equipment/systems (furnace, scrubber tank, drum dumping system, conveyor system, blower, stack and ancillary equipment such as piping and valves) that comprise the HWMU for placement in a secondary containment area (e.g., Herculite lined with sandbag berms) to collect wash water and rinseate. High pressure-low volume washing of surfaces will be used first to remove any visible process residues. Wash water will be collected and containerized. The debris will then be rinsed with potable water and the rinse water collected in either the lined containment or a separate container for sample collection. A sample of the decontamination rinseate will be collected and analyzed for barium, chromium, lead, and silver to determine compliance with OEPA Closure Guidance standards. The decontamination rinseate will be managed per procedure EP-0005, "Controlling Aqueous Wastewater Discharges into the Wastewater Treatment System."

Following decontamination, the Box Furnace debris will be containerized and dispositioned in the OSDF in accordance with the OSDF WAC. The Soil Characterization and Excavation Project will evaluate the at- and below-grade concrete and soils against WAC requirements for their disposal in the OSDF. The FEMP will continue to conduct annual inspections of this unit until closure has been completed under the Integrated RCRA/CERCLA process. Certification for the completion of closure activities for HWMU No. 14 will be provided by SCEP.

HWMU No. 15:

The Oxidation Furnace #1 is located in the north central area of Plant 8. The furnace operated as a combined reprocessing/recovery and pretreatment unit. The 54-inch (inner diameter) furnace contains six hearths lined with refractory brick and three open flame gas burners. Ancillary equipment includes Dust Collector 8-035, which supplied exhaust ventilation and a water jet scrubber for scrubbing furnace off-gas. The unit operated from 1953 until 1988.

HWMU Decontamination

The decontamination requirements needed to accomplish the remediation goals for the Oxidation Furnace #1 (HWMU No.15) consistent with the RCRA/CERCLA Integrated strategy are discussed in Section 3.5.3.3 of the Integrated RD/RA Work Plan.

The Oxidation Furnace #1 was used to process enriched materials for further use and to oxidize and/or de-water depleted uranium materials for storage or disposal. In 1998, the furnace was used to process machining sludges contaminated with 1,1,1-trichloroethane (F002). The final lot of this material remained in the unit for greater than 90 days after it was shut down. As a result, the Oxidation Furnace #1 has been designated a Hazardous Waste Management Unit.

Hold-up material from the Oxidation Furnace #1 was removed by Safe Shutdown, containerized, and managed in accordance with regulatory requirements. In accordance with Section 3.5.3.3 of the Integrated RD/RA Work Plan, equipment that contacted RCRA-listed waste can be placed directly into the OSDF provided that it meets the OSDF Waste Acceptance Criteria. Decontamination for radiological constituents, if required, will be conducted in accordance with Specification Section 01517. Any wastewater generated from decontamination activities will be managed in accordance with EP-0005, "Controlling Aqueous Discharges into the Wastewater Treatment System."

The furnace components will be dismantled, containerized and dispositioned in accordance with OSDF WAC. The refractory brick and any components that do not meet OSDF WAC (i.e. material with "visible process residues") will be containerized and placed into appropriate storage for final disposition. The Soil Characterization and Excavation Project (SCEP) will evaluate the concrete floor of Plant 8 against WAC requirements for the disposal of this

material in the OSDF. Certification for the completion of closure activities for HWMU #15 will be provided in the Project Certification Report for the Plant 8 Complex.

Asbestos Removal

Standard asbestos abatement glovebag practices are planned for the removal of friable ACM identified in Table 2-2 for Building 8A. There will be some asbestos containment work for some tanks/vessels in and around Plant 8.

Surface Decontamination

Some process debris is likely to be generated during D&D of this building. Small diameter process piping and systems with irregular interior surfaces exist that may make physical removal of visible process residues impracticable. Prior to removing debris from Building 8A, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination. Thorium contamination limits specified in the D&D contract will apply to the Old Rotary Kiln area of Building 8A.

As required in the OU3 Final ROD, and prescribed in the OU3 Integrated RD/RA Work Plan, the top inch of concrete in the Muffle Furnace Area must be removed for off-site disposal due to elevated technetium-99 concentrations. As noted in the background description for the Muffle Furnace Area, a surface concrete removal technology demonstration took place in the summer of 1998 on the first floor of the Muffle Furnace Area. Approximately 1,464 square feet of the 1,611 square feet of the first floor had at least the top inch of concrete removed and packaged for off-site disposal (DOE 1998). The remaining 147 square feet of the first floor and the entire surface area of the second floor of the Muffle Furnace Area requires at least the top inch of concrete to be removed for off-site disposal due to elevated technetium-99 concentrations. Due to the limited accessibility for scabbling equipment on the second floor of the Muffle Furnace Area, it may be more economically feasible to remove the entire concrete slab that forms the second floor and containerize it all for off-site disposal. The D&D contractor will be

required to identify their preferred method of concrete removal, which will be subject to FEMP project management approval.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, transite removal, and structural steel removal activities are planned for Building 8A. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work. Mixed waste lead was identified in the OU3 RI/FS Report to be present in Building 8A. Such lead will be containerized for off-site treatment and disposal.

3.17 Building 8B – Plant 8 Maintenance Building

Background

Building 8B (Plant 8 Maintenance Building) is a single-story structure measuring 31 ft. x 42 ft. and 15 ft. high. The building is located west of the Recovery Plant (Building 8A) and surrounded on three sides by the Plant 8 West Pad (Component 74D). Building 8B consists of cinder block walls supported on reinforced concrete footings, with a reinforced poured concrete floor and roof and glass windows. The purpose of the activity based in the building has always been maintenance of equipment in the Recovery Plant.

Process Area Description

Building 8B housed the maintenance activities for the Recovery Plant and is considered a single process area. The maintenance building consists of a small corner breakroom and an open room with a roll-up door that admitted small to medium-sized pieces of equipment for servicing and repair. The building housed tools, maintenance equipment, spare parts, and service fluid (e.g., oils and greases) for motors and other rotating equipment in one drum or smaller quantities (on the basis of inspection). Since the CERCLA process began, Building 8B has been a pumping point for transfer of perched water pumped from a shallow well outside the northeastern corner of Building 8B to the Recovery Plant for treatment. A small (less than 50-gallon) raised metal tank along the north wall received the well discharge, and a small centrifugal pump mounted on the tank transferred the perched water to the northwestern corner of the Recovery Plant via pipeline.

A floor sump at the midpoint of the south wall was used as a pipeway for steam and condensate lines. The steel cover of the sump was not removed during the inspection, so its condition and contents (water or sediment) are not known. This sump may have been used to collect floor washings from maintenance activities when the Recovery Plant was in operation. Although equipment was usually serviced in place in the Recovery Plant, smaller pieces of equipment, some of which may have been radiologically contaminated, were taken to Building 8B and may have spread contamination to the building. Several types of degreasing solvents and cleaners were used and stored in small quantities in Building 8B

Remedial Tasks

Four remedial tasks apply to Building 8B and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections were performed on this facility. Safe shutdown activities were not required since production processes were not performed in the building.

Asbestos Removal

Standard asbestos abatement glovebag practices are planned for the removal of friable ACM identified in Table 2-2 for Building 8B.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Building 8B, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal and masonry/concrete removal activities are planned for Building 8B. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.18 Building 8C – Rotary Kiln/Drum Reconditioning

Background

Building 8C (Rotary Kiln/Drum Conditioning Building) is an unused, multi-story structure located directly adjacent to the south side of the Scrap Recovery Plant (8A). The Rotary Kiln/Drum Reconditioning Building is a pre-engineered steel structure with steel siding. The structure was built on a reinforced concrete pad. The approximate dimensions of Building 8C are 50 x 100 x 33 feet in height.

Process Area Description

Building 8C is easily divisible into two process areas, which are separated by a wall. These process areas are described below.

New Rotary Kiln: The new and unused rotary kiln was installed in Building 8C to receive and dry waste residues from on-site processes. The waste residues were to be oxidized and stabilized for shipment, storage, and disposal. The new equipment includes a rotary kiln and a dust collection system. An inspection indicated no visible chemical contamination.

New Drum Reconditioning: New and unused reconditioning equipment was installed to clean and refurbish storage containers. Neither of these processes was utilized due to production suspension. No visible contamination was noted during an inspection conducted for the OU3 RI effort. Most of the equipment has been removed from the building.

Remedial Tasks

Four remedial tasks apply to Building 8C and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections were performed on this facility. Safe shutdown activities were not required since production processes were not performed in the building.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Building 8C, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal and structural steel removal activities are planned for Building 8C. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.19 Building 8D – Plant 8 Railroad Filter Building

Background

Building 8D (Plant 8 Railroad Filter Building) is a single-level building measuring approximately 30 ft. x 42 ft. and 13 ft. high. Associated with Building 8D are a subgrade Railroad Tank Car Wash Pit and a settling basin. Building 8D is located east of the Plant 8 East Pad (Component 74C) along B Street. Building 8D is surrounded by a concrete pad on the south, east, and north sides; and the Railroad Tank Car Wash Pit is located on the west side of Building 8D between the building and the Plant 8 East Pad. The settling basin is located immediately east of Building 8D toward the center of the concrete pad. Building 8D is a pre-engineered structure consisting of a structural steel frame with steel siding panels and sloped steel roof panels. The building is supported on a reinforced poured concrete base. The Railroad Tank Car Wash Pit is constructed of concrete that supported railroad tracks.

Process Area Description

Building 8D is considered one process area. Railroad gondolas filled with bulk MgF_2 from the Weldon Spring DOE facility were positioned over the Railroad Tank Car Wash Pit and unloaded onto the Plant 8 East Pad. The bulk MgF_2 was then drummed and processed. Residues from the railroad gondolas were washed into the Railroad Tank Car Wash Pit. Runoff from the pad

also drains into the Railroad Tank Car Wash Pit. Washwater and pad runoff collected in the Railroad Tank Car Wash Pit were agitated and pumped from Building 8D to Plant 8 for treatment and filtration. At one time, the collected washwater and pad runoff was sand filtered in the pit before being pumped to Plant 8.

Remedial Tasks

Four remedial tasks apply to Building 8D and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections were performed on this facility. Safe shutdown activities were not performed in Building 8D since hold-up materials were not observed in the process area.

Surface Decontamination

Process debris is not anticipated in this building. Any debris containing process residues are expected to be cleaned to meet visible inspection criteria of Specification Section 01517. Prior to removing debris from Building 8D, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal and structural steel removal activities are planned for Building 8D. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.20 Building 8E – Drum Conveyor Shelter

Background

Component 8E (Drum Conveyor Shelter) is a single-level structure with a structural steel frame and sloped metal roof. It is an extension of the Rotary Kiln/Drum Reconditioning Building (8C).

Component 8E is approximately 15 ft. in height and shelters an area of a reinforced poured concrete pad. The dimensions of the area covered by 8E are approximately 40 ft. in length and 15 ft. in width.

Process Area Description

The Drum Conveyor Shelter is a new addition to the Plant 8 complex and was not utilized. The primary function of the shelter was to provide protection to the drum conveyor that was installed to transport drums from the pad to the drum reconditioning equipment inside Building 8C. An inspection of the shelter during the OU3 RI program indicated no visible chemical contamination. The area was most recently used for the storage of miscellaneous equipment, empty drums, and wooden pallets containing 55-gallon drums.

Remedial Tasks

Three remedial tasks apply to Building 8E and are described below. No asbestos was found during inspection of this structure.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections were performed on this facility. Safe shutdown activities were not performed in Building 8E since uranium processing was not performed under this structure.

Surface Decontamination

Process debris is not present in this building. Prior to removing debris from Building 8E, all external surfaces will be cleaned to remove gross removable surface contamination. All residual dust, particles, debris, and rubble left over from the dismantlement of the structure will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Structural steel removal activities are planned for Building 8E. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.21 Building 8G – Trash Compactor Building

Background

This component is a single-story room on the east end of Building 8C where the former Oxidation Furnace #2 was located. 8G has exterior transite walls and roof

Process Area Description

The southern leg of Building 8G was converted in the early 1990s from a structure that housed the former Oxidation Furnace #2 to a trash compactor building. Controlled area trash was compressed in the trash compactor that operated in this building. No process-related debris or wastes were placed in the trash compactor. The trash compactor was relocated on-site in 1999 and Building 8G remains vacant.

Remedial Tasks

Four remedial tasks apply to Building 8G and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections were performed on this facility. Safe shutdown activities were not performed in Building 8G since processing of nuclear materials did not occur in the building while the trash compactor operated. The batt insulation in the walls was removed and the exterior of the furnace was deconned. The structure was also cleaned prior to installation of the trash compactor.

Surface Decontamination

The approach for decontamination of Building 8G is provided in the section detailed for Building 8C.

Above-Grade Dismantlement

The approach for dismantlement of Building 8G is provided in the section detailed for Building 8C.

3.22 Building 8H – Soil Washing Building

Background

This component is a single-story room that made up the west end of Building 8C. It was converted to use for soil washing back in the early 1990s.

Process Area Description

Building 8H housed the soil washing equipment.

Remedial Tasks

Four remedial tasks apply to Building 8H and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections were performed on this facility. Safe shutdown activities were not performed in Building 8H since processing of nuclear materials did not occur in the building while soil washing was performed. Much of the equipment was removed during the maintenance conversion of that portion of Building 8C and the structure was cleaned prior to installation of soil washing equipment.

Surface Decontamination

The approach for decontamination of Building 8H is provided in the section detailed for Building 8C.

Above-Grade Dismantlement

The approach for dismantlement is incorporated into the discussion of Building 8C.

3.23 Component 18B – General Sump

Background

Component 18B (General Sump) provided treatment of contaminated site effluents other than sewage. The component is located north of the Recovery Plant (Building 8A) and west of B Street. The General Sump consists of 16 tanks; most of the tanks are located outside in four separate concrete containment areas. The open area that makes up Component 18B is

approximately 113 ft. x 116 ft. The major media of Component 18B are the concrete of the containments and the steel of the tanks.

Process Area Description

Effluent from the production plants were transferred to the General Sump and combined for batch processing. The effluents were then neutralized, and coagulants were added. After coagulant addition, the effluent was transferred to the recovery plant filter system for suspended solids and precipitant removal, and the resultant filtrate was transferred back to the General Sump. At Component 18B, treated effluent was segregated on the basis of nitrate concentration and routed to either the 8-million-gallon low-nitrate Biodenitrification Surge Lagoon (Component 18A) or the 500,000-gallon High-Nitrate Holding Tank (Component 18L). Some of the wastewater streams received at the General Sump (e.g., Cooling Tower blowdown, Boiler Plant blowdown, and coal pile runoff) were permitted to be discharged directly to the Great Miami River after coagulation and settling treatments.

Remedial Tasks

Five remedial tasks apply to Component 18B and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility.

HWMU No. 48:

Uranyl Nitrate Hexahydrate (UNH) Tank F3E-223 (HWMU No. 48, Component 18B) is an outdoor, aboveground storage tank located on the southeast side of Plant 2/3. The unit consists of a 25,000 gallon cylindrical stainless steel tank located inside a secondary containment area. This area measures approximately 54 ft. x 45 ft. inches and is surrounded by a 4 ft.-7 inch high dike. Both the floor and dike are constructed of concrete coated with tar.

HWMU Decontamination

The decontamination requirements needed to accomplish the remediation goals for HWMU No. 48 consistent with the RCRA/CERCLA Integration strategy are discussed in Section 3.5.3.3 of the OU3 Integrated RD/RA Work Plan.

Tank F3E-223 was designated a HWMU because it stored waste uranyl nitrate hexahydrate (UNH), a characteristically hazardous waste, for greater than ninety days. UNH has been characterized as D002 (corrosive), D005 (barium), D007 (chromium), D008 (lead) and D009 (mercury).

Based on an evaluation of HWMU No. 48 conducted during remedial design, it was determined that no further decontamination of the tank and associated piping was required. Under Removal Action Number 20, Uranyl Nitrate Hexahydrate Neutralization Project, the tank was emptied and the UNH was treated to meet RCRA land disposal restriction requirements. The tank and associated piping were decontaminated in accordance with OEPA closure guidance standards. The analytical results for the decontamination rinseate were provided in the Removal Action Number 20 Final Report.

As a result, the secondary containment area and tank structural support foundation are the only remaining components that are required to be addressed as part of closure activities for this unit. The tank structural support foundation will be rinsed. In order to demonstrate compliance with OEPA closure guidance standards, a sample of storm water from the sump inside the secondary containment area will be collected and analyzed for corrosivity (pH), barium, chromium, lead and mercury. If there is insufficient water in the sump to obtain a sample, the secondary containment area will be rinsed with a solution of potable water and a sample of the rinseate will be collected from the sump. The analytical results will be evaluated against OEPA closure guidance levels to verify that these standards have been achieved for this unit.

The tank and associated piping will be dismantled, containerized and disposed of in the OSDF in accordance with the OSDF WAC. The Soil Characterization and Excavation Project (SCEP) will evaluate the concrete secondary containment against WAC requirements for the disposal of this material into the OSDF. Certification for the completion of closure activities for HWMU No. 48 will be provided in the Project Completion Report for the General Sump Complex.

Asbestos Removal

Standard asbestos abatement glovebag practices are planned to remove the friable ACM in Building 18B.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Component 18B, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, transite removal, and structural steel removal activities are planned for Component 18B. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work. Above-grade cinderblock walls will likely be removed by use of hoe ram or shears while liberally spraying surfaces with water to minimize airborne dusts.

3.24 Building 18D – Biodenitrification Towers

Background

Building 18D (Biodenitrification Towers) is a multilevel (six-floor) building. It is irregularly shaped, measuring approximately 72 ft. x 79 ft. and 67 ft. high. Building 18D consists of a structural steel frame on a poured concrete base and floor with uninsulated corrugated metal siding and roofing.

Process Area Description

One process area has been identified for Building 18D. High nitrate wastewaters that were collected in the BDN Surge Lagoon (Component 18A) were mixed with methanol from the Methanol Tank (Component 18J) and were fed to Building 18D, where they entered one of four 30-ft. towers that operated in series. The wastewaters flowed up through the towers,

fluidizing coal particles that had bacteria attached. The bacteria fed on and decomposed the methanol and nitrates to form carbon dioxide (CO_2) and nitrogen (N_2) gases, which bubbled off the top of the towers and are released to the atmosphere.

Remedial Tasks

Four remedial tasks apply to Component 18D and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility.

Asbestos Removal

Standard asbestos abatement for Building 18D may include floor tile removal.

Surface Decontamination

Process residues are expected on some surfaces in this building. Prior to removing debris from Building 18D, all external surfaces will be cleaned to remove gross removable surface contamination and process residues. All openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Structural steel, siding, stairs, ladders, and steel decking will likely be dismantled by a trackhoe-mounted shear.

3.25 Building 18H – BDN Effluent Treatment Facility

Background

Building 18H (BDN Effluent Treatment Facility) is a single story structure located to the north of the Plant 8 Warehouse (80). The BDN Effluent Treatment Facility consists of a reinforced concrete floor and steel frame, as well as metal siding and roofing. Building 18H contains no

asbestos materials. The approximate dimensions of Building 18H are 30 ft. x 50 ft. x 15 ft. high. The facility is situated on a 100 ft. x 100 ft. parcel of land that includes effluent treatment process equipment.

Process Area Description

Process effluent was received in Building 18H subsequent to treatment in the Biodenitrification Towers (18D). The effluent was further treated in Building 18H through chlorination and aeration to reduce biological oxygen demand (BOD) and total suspended solid (TSS) elements. Following treatment, the effluent was released to the Sewage Treatment Plant for final treatment and discharge. The equipment housed in and near Building 18H includes electrical pumps, chlorinators, process tanks, air compressors, aerators, and a filter press. The equipment located along the southwest interior wall was controlled and labeled as a radiological contamination area. Drums of Anthracite are currently stored outside Building 18H. Most equipment associated with 18H has been removed and relocated to the AWWT area (new bldg. 25K).

Remedial Tasks

Three remedial tasks apply to Component 18H and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility.

Surface Decontamination

Process residues are expected on some surfaces in this building. Prior to removing debris from Building 18H, all external surfaces will be cleaned to remove gross removable surface contamination and process residues. All openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/systems are expected to be dismantled using manual methods (unbolting, sawing, torch cutting). Such equipment will be lowered to the ground using approved hoisting/rigging equipment. Tanks and vessels will likely be sheared during structural demolition using water spray to control dusts. The acid brick will be removed for off-site disposal and the diked area will serve to collect water from spraying operations. Structural steel, siding, stairs, ladders, and steel decking will likely be dismantled by the trackhoe-mounted shear.

3.26 Component 18J – Methanol Tank

Background

Component 18J (Methanol Tank) is an aboveground, stainless steel tank 20 ft. in diameter and approximately 15 ft. high. The tank is located at the southeastern corner of the Biodenitrification Surge Lagoon (Component 18A). Component 18J is situated in a concrete containment measuring 31 ft. x 41 ft. and approximately 8 ft. high. The concrete floor of the containment area is sloped to a trench located inside the containment along the west wall, and this trench is sloped to a sump located in the northwestern corner of the containment. Component 18J contains no asbestos materials. Liquids collected in the sump were pumped to the Biodenitrification Surge Lagoon. Component 18J major media include the steel of the tank and the concrete of the containment pad.

Process Area Description

Component 18J stored methanol that was used as a food source for the biomass colony in the FEMP biodenitrification process.

Remedial Tasks

Three remedial tasks apply to Component 18J and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from the building, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal and structural steel removal activities are planned for Component 18J. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.27 Building 20E – Well House #1

Background

Building 20E (Well House #1) is a single story structure located adjacent to the south side of 2nd Street and directly north of the Elevated Potable Storage Tank (26B). Well House #1 consists of a cement block wall and concrete floor construction with the approximate dimensions of 11 ft. x 20 ft. x 9 ft. in height.

Process Area Description

Building 20E is one of three on-site pumping stations that supply the process area with water for fire protection and other potable uses. Building 20E houses one electrical water pump and accompanying equipment. There are no anticipated contaminants for the Well House #1. An inspection of the interior was conducted through the window of the structure, which indicated that the asbestos pipe insulation was present. No other visible contamination was detected.

Remedial Tasks

Four remedial tasks apply to Building 20E and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility.

Asbestos Removal

Standard asbestos abatement glovebag practices are planned to remove the friable ACM.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Building 20E, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, and structural steel removal activities are planned for Building 20E. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.28 Building 20F – Well House #2

Background

Building 20F (Well House #2) is a single story structure located directly north of Building 45A. Well House #2 consists of a cement block wall and concrete floor construction with the approximate dimensions of 11 ft. x 20 ft. x 9 ft. in height.

Process Area Description

Building 20F is one of three on-site pumping stations that supply the process area with water for fire protection and other potable uses. Building 20F houses one electrical water pump and accompanying equipment. There are no anticipated contaminants for Well House #2. An inspection of the exterior and interior exhibited no visible contamination present.

Remedial Tasks

Four remedial tasks apply to Building 20F and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility.

Asbestos Removal

Standard asbestos abatement glovebag practices are planned to remove the friable ACM.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Building 20F, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, and structural steel removal activities are planned for Building 20F. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.29 Building 20G – Well House #3

Background

Building 20G (Well House #3) is a single story structure located northwest of the Pilot Plant Thorium Tank Farm (13D). Well House #3 consists of a cement block wall and concrete floor construction with the approximate dimensions of 11 ft. x 20 ft. x 9 ft. in height.

Process Area Description

Building 20G is one of three on-site pumping stations that supply the process area with water for fire protection and other potable uses. Building 20G houses one electrical water pump,

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associated equipment, and a diesel-powered back-up electrical generator to power the pump if the structure's primary power supply was to be severed. A diesel fuel tank of approximately 150 gallons is located directly south of the building. An inspection of the component indicated that no visible chemical contamination was present.

Remedial Tasks

Four remedial tasks apply to Building 20G and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility.

Asbestos Removal

Standard asbestos abatement glovebag practices are planned to remove the friable ACM.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Building 20G, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, transite removal, and structural steel removal activities are planned for Building 20G. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.30 Building 22B – Storm Sewer Lift Station

Background

Component 22B (Storm Sewer Lift Station) is a single story structure located west of the Services Building (11). The component has a cement block wall and concrete floor

construction with the approximate dimensions of 10 ft. x 16 ft. x 8 ft. in height. Component 22B contains no asbestos materials. An access ladder is located in the southwest corner of the concrete floor. The ladder leads down to the pump room, which is approximately 20 feet below grade. The ladder access point is posted as a confined space.

Process Area Description

The Storm Sewer Lift Station was used to pump accumulated site stormwater off-site to the Great Miami River. The station is no longer operational but still houses two electrical pumps, electrical equipment, control panels, photometer, flow rate meter, NPDES composite sampler, and other accompanying equipment. Stormwater monitoring equipment is also located in the building. An inspection of the component revealed no visible chemical contamination.

Remedial Tasks

Three remedial tasks apply to Building 22B and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Building 22B, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, transite removal, and structural steel removal activities are planned for Building 22B. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.31 Building 22D – Scale House & Weigh Scale

Background

Component 22D (Scale House and Weigh Station) is a single story structure located directly east of the Elevated Water Storage Tank (26B). The Scale House consists of a structural steel frame, reinforced concrete floor and transite siding. The facility has the approximate dimensions of 12 ft. x 52 ft. x 10 ft. in height. The scale is situated approximately two feet below grade.

Process Area Description

Component 22D was used to determine the weight of incoming and outbound multi-axle vehicles prior to the installation of the Truck Scale (22C). The scale was also used to weigh outbound sea/land cargo containers. The Scale House contains operational equipment including a digital scale, printer, power control switches and a grated sump. Several motor oil spots were noted on the scale during a visual inspection of the component. Also noted were broken and cracked transite panels on the lower east side of the building. There are no other anticipated contaminants.

Remedial Tasks

Four remedial tasks apply to Building 22D and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility.

Asbestos Removal

Standard asbestos abatement glovebag practices are planned to remove the friable ACM.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Building 22D, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and

containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, transite removal, and structural steel removal activities are planned for Building 22D. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.32 Component 22E – Utility Trench To Pit Area

Background

Component 22E is a subgrade concrete trench and steel piping system. The component is approximately 1,500 ft. long and 3 ft. wide. Component 22E contains no asbestos materials.

Process Area Description

Component 22E is considered one process area and was used in the pumping of high-radium raffinate slurry from the Hot Raffinate Building (Component 3E) to K-65 Silos 1 and 2. Also, decant from the K-65 Silos was returned through the trench and collected in the tank located on the northwestern corner of Component 3E before being transferred for treatment. Component 22E also contained pneumatic lines running to Silo 3 and liquid lines used to connect water treatment processes and sources in the Pit Area to process area systems.

Remedial Tasks

Three remedial tasks apply to Component 22E and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Component 22E, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the

removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, and structural steel removal activities are planned for Component 22E. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.33 Building 26A – Pump House – HP Fire Protection

Background

Component 26A (Pump House - HP Fire Protection) is located south of the Elevated Water Storage Tank (26B). Component 26A is comprised of a steel water storage tank and cement block wall and concrete floor building. The dimensions of the tank are 35 ft. in diameter by 22 ft. in height. The volume capacity of the tank is approximately 300,000 gallons. The dimensions of the building are 26 ft. x 50 ft. x 11 ft. in height. Component 26A contains no asbestos materials.

Process Area Description

Component 26A was installed to provide the site with a water supply for fire protection. The building houses three electrical pumps that draw water from the tank as required.

Remedial Tasks

Three remedial tasks apply to Building 26A and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility.

Surface Decontamination

Process debris is not anticipated in this building.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, transite removal, and structural steel removal activities are planned for Building 26A. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.34 Building 26B – Elevated Water Storage Tank

Background

Component 26B (Elevated Water Storage Tank) is located north of the Pump House-HP Fire Protection (26A). Component 26B is a steel water storage tank elevated by a steel support to 265 feet above grade. The tank has a diameter of 65 feet, and a capacity of approximately 350,000 gallons. Component 26B contains no asbestos materials.

Process Area Description

Component 26B was installed to provide the site with a water supply for fire protection. There are no anticipated contaminants for the Elevated Water Storage Tank.

Remedial Tasks

Three remedial tasks apply to Building 26B and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility.

Surface Decontamination

Debris is not anticipated in this building. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.35 Building 28D – Guard Post Adjacent to 74Q (formerly from W. End of 2nd St.)

Background

Building 28D, Guard Post, is a square building located on the southeast corner of Pad 74Q. Prior to movement this location in 1999, it was located at the west end of 2nd Street. The dimensions of the building are 15 ft. x 15 ft. Building 28D is constructed of wood framing and siding. Building 28D contains no asbestos materials.

Process Area Description

Historically, Building 28D was occupied by guards who used the building as a checkpoint area to provide access control to the K-65 Silo and waste pit areas. The building was later used to maintain radiological monitoring equipment for controlling contamination upon exiting the area until the building was moved in 1999 to the interim storage site adjacent to Pad 74Q. The shelter now awaits demolition either under the Multi-Complex D&D or under a routine maintenance D&D activity.

Remedial Tasks

Three remedial tasks apply to Building 28D and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Building 28D, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, transite removal, and structural steel removal activities are planned for Building 28D. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.36 Building 39A – Incinerator Building

Background

Building 39A (Incinerator Building), a two-story square structure measuring approximately 53 ft. x 53 ft. and 25 ft. high, is located within the west-central portion of the FEMP Production Area between the Ore Refinery Plant (Component 2A) and the Recovery Plant (Component 8A) and along 102nd Street. The building consists of a structural steel frame on a reinforced poured concrete base and floor, transite interior and exterior siding panels (insulation materials between panels), and transite roof panels.

Process Area Description

Building 39A contains four processes: the drum dryer, the trash baler, the liquid waste incinerator, and the solid waste incinerator. Initially, this facility was entirely devoted to the drum dryer process; once the drum dryer was removed, the trash baler and solid and liquid waste incinerators were added. The drum dryer and the liquid waste incinerator processes are considered wet processes.

Drum Dryer: Aqueous raffinate slurry from the extraction process in the Ore Refinery Plant, which comprised acid insoluble solids, soluble acid nitrates, and excess nitric acid, was dried on two large rotary drums on the second floor in an acid-brick-lined diked area. A recycle surge tank was attached to the feed pan of each filter. As the dried raffinate cake was scraped off the rotary drum, it fell into one of two gas-fired rotary calciner furnaces located on the first floor, where it was further dried. Metal oxides were discharged from the rotary calciners into the William's hammer mill. The pulverized particles were pneumatically conveyed to Silo 3, a large, outdoor storage tank. Nitric acid and water vapors from the drum driers and the rotary calciners were exhausted by means of a venturi-type scrubber, located on the diked pad north of Building 39A. A knife grinder, used to sharpen the filter cake knives on the filters, was located in the center of the second floor. All drum dryer process and

associated equipment has been removed, leaving the second floor empty and allowing for the installation of the trash baler and the solid and liquid waste incinerators on the first floor.

Trash Baler: Solid wastes generated by site operations were transported to Building 39A in dumpsters for sorting and incineration or compaction. The dumpsters were emptied onto the conveyor component of Building 39A, which carried the solid wastes to the sorting platform, where they were segregated into burnable and non-burnable piles. Solid wastes capable of being incinerated were taken to the solid waste incinerator, while non-burnables, such as metal, glass, and plastics, were placed in the vertical crusher of the trash baler. The vertical crusher has been replaced by the supercompactor.

Liquid Waste Incinerator: The liquid waste incinerator (also referred to as the trane incinerator) is a gas-fired single-chamber unit consisting of a 50-gallon feed tank, air intake ductwork and two blowers, a primary burn chamber, exhaust ductwork, a vertical discharge stack, a baghouse filter, and an electrical control panel. Other equipment associated with the liquid waste incinerator but not in Building 39A includes a 5,800-gallon storage tank, a concrete storage pad located east of Building 39A, an oil/water separation unit in Building 39B, and an overhead oil transfer line that terminates at the 50-gallon feed tank. This process was used from 1980 to 1986 to incinerate waste oils generated by various plants. In general, waste oil was transported to the oil/water separator unit in the waste oil decant shelter (Component 39B), then pumped from the separation unit to the 5,800-gallon storage tank or the 50-gallon feed tank. The waste oil was then incinerated, and exhausts were directed to a baghouse filter for ash removal before being vented through a stack. Drums of waste oil awaiting incineration were stored on the concrete pad east of Building 39A. Samples of the waste oil exhibited 1,1,1-trichloroethane and lead concentrations above regulatory threshold levels. Per RCRA regulations, the waste oils were classified as hazardous wastes, and the liquid waste incinerator and associated equipment were designated as an HWMU.

Solid Waste Incinerator: Vehicle loads of burnable materials were delivered into Building 39A and put onto the lower section of the trash baler conveyor. Burnables were then placed in the feed hopper to be fed into the main chamber of the solid waste incinerator (also referred to as the Kelley incinerator). A thermal reactor mounted above the main chamber burned the particulate matter before it entered the stack.

Remedial Tasks

Four remedial tasks apply to Building 39A and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility.

Asbestos Removal

Standard asbestos abatement glovebag practices are planned to remove the friable ACM.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Building 39A, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, transite removal, and structural steel removal activities are planned for Building 39A. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.37 Building 45A – Maintenance Machine Shop Building

Background

Building 45A (Maintenance Machine Shop Building) is a single-story building. It is rectangular, measuring approximately 121 ft. x 150 ft. and 14 ft. high. The building consists of a structural steel frame with corrugated metal siding and a poured concrete base and floor.

Process Area Description

The primary purpose of Building 45A was to develop techniques, machines, and machining tools for the machining of uranium and thorium. The facility also housed an experimental rolling mill in the south bay and induction heat treating equipment in the center bay. Building 45A was thoroughly decontaminated in 1988, before conversion for office space. Building 45A contains one process area. Currently, the building contains machine shop equipment, small tools, and equipment.

Remedial Tasks

Four remedial tasks apply to Building 45A and are described below.

Preparatory Action: Facility/Safe Shutdown

Utility disconnections and removal of gross contamination were performed on this facility.

Asbestos Removal

Standard asbestos abatement glovebag practices are planned to remove the friable ACM.

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Building 45A, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, transite removal, and structural steel removal activities are planned for Building 45A. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.38 Building 80 – Plant 8 Warehouse

Background

Building 80 (Plant 8 Warehouse) is a single-story building located southwest of the Recovery Plant (Component 8A). The rectangular building measures approximately 60 ft. x 170 ft. and 15 ft. high and consists of a structural steel frame on a reinforced poured concrete base and floor with uninsulated corrugated metal siding and roofing. Building 80 was built in 1989 for use as a drum storage unit for non-liquid RCRA hazardous wastes. Building 80 contains no asbestos materials. A small office trailer has been placed in the southwestern corner of the building.

Process Area Description

Building 80 was constructed in 1989 for use as a hazardous waste container storage facility. Initially, the building was used primarily for the storage of containers of hazardous waste without free liquids. In 1996, Building 80 was upgraded to stored hazardous waste with free liquids. These upgrades included the construction of the secondary containment dike and the re-application of floor sealant. In 1997, solvent extraction of mixed/PCB wastes was conducted in Building 80 as part of the Organic Extraction Project (OEP). The building is currently being used to support nuclear materials repackaging operations.

Remedial Tasks

Three remedial tasks apply to Building 80 and are described below.

Preparatory Action: Facility/Safe Shutdown

Facility/Safe Shutdown activities are completed.

HWMU No. 29

Building 80 (The Plant 8 Warehouse) is a designated RCRA hazardous waste storage area, Hazardous Waste Management Unit No. 29. The secondary containment area is constructed of a four inch by six inch steel angle iron frame dike. The base of the secondary containment area was re-coated with a chemically resistant sealant in December 1996.

HWMU Decontamination

The decontamination requirements needed to accomplish the remediation goals for HWMU No. 29 (Building 80) consistent with the RCRA/CERCLA Integration strategy are discussed in Section 3.5.3.3 of the OU3 Integrated RD/RA Work Plan.

In an October 29, 1999 letter to Ohio EPA, the FEMP outlined the process for decontaminating the hazardous waste storage area in Building 80 prior to initiating nuclear materials repackaging operations. Based on a review of facility release reports and inspection logs, it was determined that there was minimal potential for release of hazardous waste constituents to Building 80. Only two releases of hazardous waste had been reported in Building 80 since 1989. One release, which occurred in 1990, involved approximately one ounce of hazardous waste that seeped from the bottom of a drum seam onto a pallet. The spilled material never reached the floor beneath the pallet. The second release occurred in 1994 and involved approximately one pound of grit blast waste characterized as D008 - lead. This material was promptly cleaned up using absorbent pads.

Based on this information, it was determined that decontamination of HWMU No. 29 could be achieved by using a wet vacuum/floor scrubber to clean the secondary containment area following removal of the hazardous waste inventory. This action was completed prior to turning the building over to Nuclear Materials Disposition. Since the completion of these actions, no containers of hazardous waste have been stored in Building 80. Therefore, no further decontamination of HWMU No. 29 is required

Surface Decontamination

Process debris is not anticipated in this building. Prior to removing debris from Building 80, all external surfaces will be cleaned to remove gross removable surface contamination and all openings of equipment and debris that potentially contain internal contamination will be sealed or encapsulated. All residual dust, particles, debris, and rubble left over from the removal of equipment/systems and dismantlement of other internal structures will be collected and containerized. HEPA vacuuming, hydro-blasting with a minimum of 1,000 psi, and surface wipe-downs are likely methods for removing/fixing contamination.

Above-Grade Dismantlement

Equipment/system removal, masonry/concrete removal, transite removal, and structural steel removal activities are planned for Building 80. Hydraulic shear technology will likely be used for structural steel and some equipment/system removal work.

3.39 Component G-008 – Miscellaneous Pipe, Pipe Racks, Conduit and Cable

Background

Pipe racks around the Multi-Complex D&D project components are steel structures that support steam lines and other utilities required for process support activities. The pipe bridges that are included in the Multi-Complex D&D project include those that generally reside in the block bounded by B Street and the western Controlled Area fenceline, and between 1st and 2nd street.

Remedial Tasks

Four remedial tasks are applicable to Component G-008.

Preparatory Action: Facility/Safe Shutdown

Isolation of utilities routed through the pipe bridges has been performed. Holdup material was not present in these pipe supports. All utilities have not been isolated on high lines in these areas.

Asbestos Removal

Asbestos removal will consist of removing insulation from pipes and steam lines. Individual asbestos work areas (e.g., glove-bag removals) may be used around appropriate sections of pipe. The ACM is in good condition.

Surface Decontamination

Standard methods for removal/fixing of surface contamination are anticipated for interior surfaces of G-008 that may contain loose contamination.

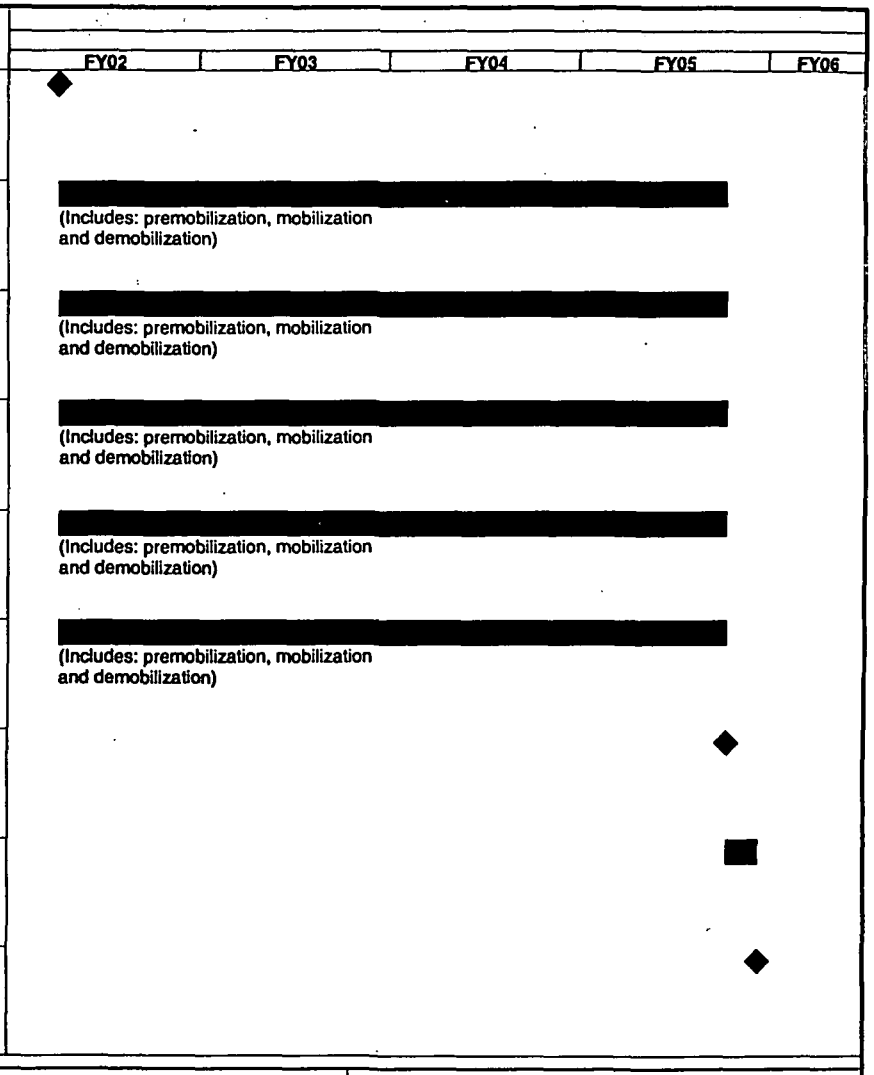
Above-Grade Dismantlement

Material take-off estimates reveal that structural steel and miscellaneous steel pipe and conduit will constitute the majority of the waste stream from the pipe bridges. Use of hydraulic shears or oxy-acetylene torch are the preferred methods for structural dismantlement after asbestos has been removed.

4.0 SCHEDULE

This section presents the planning and implementation schedules for the Multi-Complex D&D project. Figure 4-1 presents the schedule for implementation of field activities beginning with the Contractor's Notice To Proceed (NTP) and ending with the submittal of the Project Completion Report. The primary milestones of the project include the following: 1) NTP and 2) Completion of Field Activities, and the submittal of the Project Completion Report to U.S. EPA and Ohio EPA. The content for the Project Completion Report is outlined in Section 4.5 of the OU3 Integrated RD/RA Work Plan.

Activity Description	Early Start	Early Finish	Orig Dur
NOTICE TO PROCEED	07JAN02*		0
FIELD REMEDIATION OF PLANT 2 COMPLEX	07JAN02	14JUL05	1,285
FIELD REMEDIATION OF PLANT 3 COMPLEX	07JAN02	15JUL05	1,286
FIELD REMEDIATION OF PLANT 8 COMPLEX	07JAN02	15JUL05	1,286
FIELD REMEDIATION OF GENERAL SUMP COMPLEX	07JAN02	15JUL05	1,286
FIELD REMEDIATION OF LIQUID STORAGE COMPLEX	07JAN02	15JUL05	1,286
COMPLETION OF FIELD ACTIVITIES		15JUL05	0
PREPARE PROJECT COMPLETION REPORT	16JUL05	13SEP05	60
SUBMIT PROJECT COMPLETION REPORT TO US/OEPA		13SEP05	0



Start Date	01OCT97
Finish Date	13SEP05
Data Date	31DEC97
Run Date	21AUG01 10:21

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OPERABLE UNIT 3 D&D SCHEDULE

MULTI-COMPLEX D&D

FIGURE 4-1 Multi-Complex D&D Project Remediation Schedule

5.0 MANAGEMENT

The implementation of the Multi-Complex D&D project will be performed through a coordinated effort by the D&D Contractor, FEMP Project Management and support organizations, and DOE Project Management. Section 7 of the OU3 Integrated RD/RA Work Plan provides the overall management structure applied to this remediation project. A description of project-specific management responsibilities has been highlighted for the Multi-Complex D&D Project in this section.

DOE will provide direct project oversight in two ways, both of which become a concerted effort to ensure that remedial activities are performed according to project specifications and requirements. The DOE Office of Safety Assessment has assigned a Facility Representative from the Fernald Area Office whose responsibilities will be to perform independent field oversight of all remedial activities performed under this project. This individual will be responsible for weekly coverage of all field activities and necessary reporting to the DOE Program Manager at the Fernald Area Office. The Facilities Representative will have the authority to stop work if conditions warrant such action. DOE Fernald Area Office will also conduct field oversight in the areas of construction, engineering, quality assurance, and health and safety. The DOE Facilities Representative and others will immediately notify the DOE Project Manager of any issues or problems that arise in an effort to seek prompt resolution.

The DOE Project Manager and the environmental management contractor, Fluor Daniel Fernald, will oversee the remedial action through its project team review and approval process and by performing the following functions:

- ensuring that the Contractor is provided with the proper direction and support necessary to meet the remedial action objectives for this project;
- detailing all work conditions and scope requirements;
- conducting an alignment meeting where all project personnel will be instructed on the Safe Work Plans, pre-construction meetings, daily pre-work scope and safety briefings, and weekly coordination meetings with the Contractor to address all concerns, schedule status, planning, progress, and deviations;
- performing quality assurance and quality audits of all remediation tasks to determine adherence to project specifications;

- verifying work is performed in compliance with approved health and safety plans; and

- performing pre-final and final inspections.

The Contractor will perform D&D of the components, material sizing, segregation, and loading into containers and/or stockpiling. FEMP Waste Management personnel will perform container transport to and from the project area.

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APPENDIX A

PROPOSED SAMPLING

Several types of sampling were identified early in the design process to support both the design itself and to support logistical planning for field remediation. The scope and requirements for potential D&D sampling were outlined in the Sampling and Analysis Plan, included as Appendix D to the OU3 Integrated RD/RA Work Plan. A project-specific summary of the sampling types are included below.

Characterization Screening

Lead screening was conducted during the OU3 RI/FS using X-Ray Fluorescence (XRF) screening of media for lead based paint. No additional XRF screening was required to support D&D design; however, the D&D Contractor will be required to assess surfaces of steel proposed to be cut using hot methods to address potential lead emissions. XRF screening is the preferred method for lead sampling. Radiological surveying has been conducted for fixed and removable radioactive contamination using Geiger-Mueller radiological contamination meters and will continue to be used throughout D&D activities to verify that radiological facility release criteria (i.e., release from containment) are met on equipment and materials being removed from the project contamination.

Asbestos

This category represents samples that have been collected to verify whether a certain material is considered ACM and whether the ACM is regulated or non-regulated. Asbestos surveys were conducted prior to the design of this D&D project and the results were incorporated. Section 2.2 presents a summary of materials found to contain friable ACM. It is not anticipated that additional asbestos bulk samples will be needed during D&D. Asbestos air sampling will be performed during asbestos abatement.

Secondary Waste (Decontamination Water)

Based on worst-case wash-down calculations, up to 340,000 gallons of decontamination washwater could be generated during equipment cleaning. Samples will be used to

determine the need for treatment prior to discharge into the AWWT. Based on this worst-case washwater volume estimate, 113 samples would be needed to characterize washwater for isotopic radionuclides and heavy metals, up to 162 samples would be needed to evaluate enrichment (i.e., levels of U-235 to total Uranium), and two samples each for Volatile Organic Aromatics for closure of HWMU No. 10, No. 14, No. 15, No. 47 and No. 49.

A project-specific sampling plan for the decontamination washwater will be developed after decontamination washwater is generated but prior to actual sampling. An example of a typical wastewater sampling plan is attached to Appendix D of the OU3 Integrated RD/RA Work Plan.

Nevada Test Site (NTS) Confirmatory

To qualify debris for NTS shipment, one percent of each material/waste stream going to NTS will be sampled. For each container that makes up the one percent, three samples will be taken and analyzed in accordance with the NTS Waste Acceptance Criteria (WAC).

Permitted Off-site Commercial Disposal Facility

Sampling is anticipated from potential mixed waste sludge that will be collected from the settling of decontamination washwater and associated filtercake. Mixed waste may result from the collection of lead-based paint in the filtrate. Sampling and analysis required for shipment certification will be as specified by the permitted facility's WAC. Section 3.2.3 of the SAP contained in Appendix D of the OU3 Integrated RD/RA Work Plan addresses analytical requirements for off-site disposal.

Asbestos Air Monitoring

Asbestos air sampling will be necessary since friable and non-friable ACM will be removed prior to dismantlement under controlled abatement methods per Specification Section 01516 and 07415. Occupational air sampling for asbestos will be performed as required by OSHA standards.

Radiological Air Monitoring

Data from the IEMP site-wide routine environmental air monitoring program will be used to complement the occupational air monitoring program. Per the FF Radiological Control Requirements Manual, occupational air (i.e., breathing zone) samplers will be worn by approximately twenty-five percent (25%) of the workers in each work group/crew (minimum of one worker) when performing uranium airborne generating activities in a contamination area, high contamination area, or an airborne radioactivity area. Per the FF Radiological Control Requirements Manual, occupational air (i.e., breathing zone) samplers will be worn by one hundred percent (100%) of the workers in each work group/crew when performing thorium airborne generating activities in a contamination area, high contamination area, or an airborne radioactivity area.

Fluor Fernald reviews safe work plans to ensure that they include the appropriate engineering and administrative controls to mitigate the spread of radiological contamination and limit airborne radioactivity concentrations to levels at or below those specified in the IFB/RFP. Fluor Fernald performs an occupational ALARA review or evaluation (as appropriate) for each component undergoing D&D.

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APPENDIX B

EVALUATION OF MATERIAL DISPOSITION ALTERNATIVES FOR THE MULTI-COMPLEX

Per the OU3 Record of Decision for Final Remedial Action, the selected disposition route for the majority of OU3 radiologically contaminated material, including accessible metals, is placement in the On-Site Disposal Facility (OSDF). However, in support of DOE's commitment to evaluate recycling on a case-by-case basis during each above-grade D&D project design (per Section 3.3.6.1 of the OU3 Integrated Remedial Design/Remedial Action Work Plan under the subheading of Unrestrictive Release Recycling/Reuse), an evaluation of disposition alternatives was performed for potentially recyclable/reusable materials estimated to be generated from the Multi-Complex. Using the Decision Methodology for Fernald Material Disposition Alternatives (the "Decision Methodology"), which was finalized in July 1997 following extensive stakeholder involvement and subsequent reevaluation of unit costs using 1998 recycling data from the Recycling Supplemental Environmental Project, 2875 tons of potentially recyclable accessible metals (OU3 Debris Category A) from all Multi-Complex components was evaluated by comparing the four leading alternatives to on-site disposal.

The Decision Methodology consists of three phases: 1) Threshold Phase; 2) Life Cycle Analysis Phase; and 3) Decision Phase. The first phase, the Threshold Phase, includes a comparative evaluation of project costs for each alternative. The cost estimates which were established under the Plant 4 Case Study (presented during July 8, 1997 public meeting; cost data dated from September 27, 1996) were utilized for the 2875 tons of structural steel from the Multi-Complex. Since total cost estimates for each recycling alternative are current, and other factors such as vendor and market information have not significantly changed since the Plant 4 evaluation was performed, unit rates for each of the recycling alternatives shown in the Plant 4 Case Study are considered valid for the Pilot Plant Complex alternative disposition alternative evaluation. The total cost comparison of the disposition alternatives is shown in Table B-1.

TABLE B-1 Total Cost Comparison for Disposition Alternatives

Disposition Alternative	Cost Per Pound	Total Cost	Percent Above Lowest Cost
On-Site Disposal Facility	$ 0.04	$230,000	--
Vendor Material Release Facility	$ 0.41	$2,357,500	1,025%
FEMP Material Release Facility	$ 0.97	$5,577,500	2,425%
"Recycle 2000"	$ 1.20	$6,900,000	3,000 %
Privatized FEMP Material Release Facility	$ 0.56	$3,220,000	1,400%

The comparison of total costs between disposal in the OSDF and the four recycling alternatives indicates that each of the recycling alternatives greatly exceeds the 25 percent total cost criteria established for the Threshold Phase. As a result, only the lowest cost alternative (i.e., on-site disposal) meets the minimum criterion defined for the Threshold Phase. Therefore, as identified in the Decision Methodology, no further consideration of these decision alternatives is warranted and the disposition decision the estimated, 2875 tons of accessible metals is disposal in the OSDF. Should vendor or market conditions change significantly prior to OSDF disposal of the structural steel, whereby the total costs of any of the recycling alternatives approach the cost threshold for further evaluation, then an re-evaluation of the disposition alternatives would be considered.

APPENDIX C

PERFORMANCE SPECIFICATIONS

The project specification included in this appendix represent a modified version of the original set of performance specifications contained in the May 1997 final version of the OU3 Integrated RD/RA Work Plan. These project-specific specifications incorporate lessons-learned from previous D&D projects at the FEMP and identify new and innovative technologies and methods that are applicable to the Multi-Complex D&D project.

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FLUOR DANIEL FERNALD

3873

DEMOLITION CLOSURE PROJECT

SPECIFICATIONS

PROJECT: 01789
SPEC 01789-TS-0001
FLUOR FERNALD ENGINEERING SUPPORT
REVISION 0

PREPARED BY: _____ 9/4/01
Joseph S. Stoner — Date

APPROVED BY: _____ 9/4/01
Dave G. Balzen — Date

U. S. DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Fluor Daniel Fernald
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Cincinnati, Ohio 45253-8704

ISSUE AND REVISION SUMMARY

Revision	Date	Description of Issue or Revision
0	09/04/01	Issued CFC

Title: Demolition Closure Project	Specification No: 01789-TS-0001		
	Date: 09/04/01	Table of Contents	Rev 0

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END OF SECTION

Approved: _____ 9/
Joseph S. Stoner Date

SECTION 01010

GENERAL REQUIREMENTS

PART I GENERAL

1.1 SUMMARY

A. The intent of these Specifications is to establish technical requirements necessary to support the above-grade decontamination and dismantlement (D&D) of the structures and components at the Fernald Environmental Management Project (FEMP).

B. In all cases where the terms "Vendor", "Seller", "Manufacturer", or similar terms appear in these Specifications, they shall be understood to refer to an individual or firm(s) providing materials, equipment or services, as noted, under a contract to Fluor Fernald.

C. In all cases where the term "Contractor" appears in these Specifications, it shall be understood to refer to the Contractor and their subtier contractors who are performing the D&D services at the FEMP.

D. General: The Technical Specifications are of the abbreviated, simplified, or streamlined type and include incomplete sentences. Omissions of words or phrases such as "the contractor shall," "in conformity therewith," "shall be," "as noted on the drawings," "according to the plans," "a," "the," and "all" are intentional. Omitted words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the drawings.

For convenience of reference and to facilitate the letting of contracts, the Specifications may be separated into titled Divisions. The following defines the separations referred to in the Specifications:

1. Section: Separate numbered section of a Specification (e.g., Section 16020)
2. Article: Separate numbered article of a Subsection (e.g., Article 2.1)

F. Definitions: Certain terms and words as used throughout the Specifications shall be defined as follows, unless otherwise particularly specified:

1. "Provide": Furnish and install, complete, in place.

2. "Indicated": As shown on the drawings and/or specified.

3. "Directed," "Authorized," "Permitted": Shall be as directed, authorized, or permitted by Fluor Fernald.

4. "Selected": Shall be as selected by the Contractor or Fluor Fernald.

5. "Satisfactory," "Acceptable": Satisfactory or acceptable to Fluor Fernald. - 3873

6. "Necessary," "Required," "Suitable": As necessary, required, or suitable for the intended purpose as determined by Fluor Fernald.

7. "Submit": Submit to Fluor Fernald unless otherwise specified.

8. "Above-grade": Refers to first, second, third, etc., stories of a facility, and accessible materials/equipment in basements, sumps, pits, and trenches of a facility.

9. At- and Below-grade: Slab, and/or basement, foundation, loading docks, etc.

10. In all cases where the words "or equal" appear in these specifications, they shall be understood to mean "or approved as equal by Fluor Fernald."

11. Where the Sections refer to Parts 6, 7, 8 or 9, the reference will be to the IFB/RFP or the Contract, whichever is applicable.

1.2 REFERENCES, CODES, AND STANDARDS

All work shall be accomplished in accordance with the code requirements listed below. References to specific codes, regulations, standards, or other criteria documents in these Sections are indicated as the latest edition of revision of each document, as of the date when these Sections were prepared. Invoking all or any part of these standards is to be accomplished in accordance with normal industry practices. Standards listed in these Sections can be used in their entirety or applicable sections depending on their application to the services being rendered by the Contractor.

A. Ohio Basic Building Code (OBBC) 1994

B. Life Safety Code 101A - 1998

C. Other applicable National Fire Protection Association (NFPA) Codes - All inclusive, including 1998 revisions

D. 29 CFR 1910 - Occupational Safety and Health Administration - Department of Labor

E. 29 CFR 1926 - Occupational Safety and Health Administration (OSHA)

F. 40 CFR - United States Environmental Protection Agency (U.S. EPA)

G. DOE Order 440.1 - Worker Protection Management for DOE Federal and Contractor Employees

H. DOE Order 441.1 - Radiological Protection for DOE Activities

I. DOE Order 5400.5 - Radiation Protection of the Public and the Environment and 10 CFR 835 - Occupational Radiation Protection

1.3 SUBMITTALS

A. An Installation, Operation, and Maintenance (IOM) Manual shall be prepared so as to provide optimum operation and maintenance of any equipment and systems that may be required.

B. The cover of the IOM Manual shall include the following information:

1. Project Title - _____,
2. Contractor,
3. Construction Manager - Fluor Fernald, and
4. Subtier Contractor (name, if any).

C. The IOM Manuals shall be bound into one or more volumes for ease of handling, and shall have an index. The manual shall include descriptive literature, drawings, performance curves and rating data, test reports, and spare parts lists. The maintenance section shall divide maintenance procedures into two categories, "Preventive Maintenance" and "Corrective Maintenance," and a subsection for "Safety Precaution." Preventive maintenance shall include cleaning and adjustment instructions. Corrective maintenance shall include instructions and data arranged in the normal sequence of corrective maintenance (i.e., troubleshooting, logical effect to cause), then repair and replacement of parts, then the parts list. Safety Precautions shall comprise a list of safety precautions and instructions to be followed before, during, and after making repairs, adjustments, or routine maintenance.

1.4 QUALITY REQUIREMENTS

A. The Contractor shall provide written procedures for Fluor Fernald's review and approval of all tests to be performed as identified in the drawings and specifications. These procedures shall provide the detailed step-by-step operations with sign-off columns and date columns and shall be submitted and approved prior to testing.

B. The Contractor shall not deviate from construction acceptance tests as reviewed and approved by Fluor Fernald.

C. All test instruments shall have been calibrated within 12 months prior to use on this contract or at intervals as recommended by vendor, by a calibration laboratory whose calibration equipment and instruments are fully traceable to National Institute of Standards and Technology (NIST) standards. The Contractor shall provide individual certification of calibration and NIST standards traceability for all test instruments used on this contract.

1.5 ABBREVIATIONS FOR REFERENCED STANDARDS AND SPECIFICATIONS

The following list denotes abbreviations used in the technical portions of these Sections:

Abbreviation	Authority or Title
AASHTO	American Association of State Highway Transportation Officials

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Abbreviation	Authority or Title
AGA	American Gas Association
AGC	Associated General Contractors of America
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
CFR	Code for Federal Regulations
ERDA	Energy Research and Development Administration
IFB	Invitation for Bid
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
RFP	Request for Proposal
UL	Underwriters Laboratories, Inc.

END OF SECTION

Approved: Joseph S. Stoner 9/4/01 Date

SECTION 01120

DEBRIS/WASTE HANDLING CRITERIA

PART I GENERAL

1.1 SCOPE

This Section provides the requirements for handling, containerization and stockpiling of debris/waste generated during the dismantlement of FEMP processing and support facilities. Debris/waste shall be segregated into established categories and containerized as directed in this Section. This includes, but is not limited to, the following:

A. Classification of materials by segregation category,
B. Segregation of materials,
C. Containerization/loading,
D. Movement of containers within the construction zone,
E. Tagging containers,
F. Debris stockpiling, and
G. Collection and containerization of controlled area office trash from Contractor-owned office trailers.

1.2 RELATED SECTIONS

A. Section 01515 - Mobilization, Demobilization, and General Site Requirements
B. Section 01516 - Asbestos Abatement
C. Section 01517 - Removing/Fixing Radiological Contamination
D. Section 01519 - Decontamination of Contractor Provided Tools, Equipment, and Material
E. Section 03315 - Concrete/Masonry Removal
F. Section 05126 - Structural Steel Dismantlement
G. Section 07415 - Transite Removal
H. Section 15065 - Equipment/System Dismantlement
I. Section 15067 - Ventilation and Containment

1.3 REFERENCE MATERIALS

See Parts 6 and 7 for the following:

A. Index of Drawings,
B. Photographs,
C. Drawings,
D. Contractor Safe Work Plan Format Requirements, and
E. Waste Management Plan (WMP), which includes the Material Segregation and Containerization Criteria (MSCC) form. The MSCC form identifies anticipated waste streams to be generated and

their respective waste categories. In addition, the MSCC identifies containers (where applicable) for the waste streams, size criteria, and special waste handling criteria. Debris is defined as dismantled piping, equipment, systems, components, asbestos-containing materials (ACM), etc. that is contained within the project boundaries.

1.4 REFERENCES, CODES AND STANDARDS

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All work shall be accomplished in accordance with the following code and standards:

A. DOE Order 460.1A Packaging and Transportation Safety, and
B. 10 CFR 835 Occupational Radiation Protection.

1.5 SUBMITTALS

The Contractor shall submit the following for approval by Fluor Fernald:

A. Debris/Waste Handling Safe Work Plan

Prior to mobilization, the Contractor shall submit a detailed debris/waste handling Safe Work Plan for approval by Fluor Fernald, in accordance with the Contractor Safe Work Plan Format Requirements contained in Part 7 - ACR-002. The Safe Work Plan shall include the Contractor's:

1. Method of cutting to meet debris size requirements (if different from methods used for dismantlement),
2. Proposed equipment for loading and handling containers,
3. Method to verify that the weight capacity of each container is not exceeded,
4. Method for loading containers,
5. Method for segregating waste categories,
6. Method for moving debris in and around project area (debris flow),
7. Proposed container staging areas, as required by this Section, and
8. Material inspection area.

B. Monthly Container Report

A report shall be submitted identifying the current waste container stock listing of drums and all metal boxes delivered to and staged at the project site. This report shall be by inventory number; shall be issued on a monthly basis; and shall describe the usage and/or contents of the waste containers under control by the Contractor.

1.6 PROJECT CONDITIONS

A. Generation of additional debris/waste shall be minimized. Waste minimization shall include but not be limited to, unpacking equipment and material prior to entering the Controlled Area. The Contractor shall not bring any hazardous material to the construction zone unless prior approval is received from Fluor Fernald. Alternatives to hazardous materials shall be used whenever possible.

B. The Contractor shall notify Fluor Fernald immediately when hazardous or mixed wastes are found or, whenever possible, before they are generated. Further management of these wastes

shall be coordinated with Fluor Fernald.

C. All waste and debris designated for placement in the OSDF from thorium-contaminated areas shall be free of visible material. The Contractor shall high-pressure rinse and lock down these items. The *exterior* surfaces of roll-off boxes used to transport these items to the OSDF shall be decontaminated as necessary and released from thorium controls prior to their pick-up for movement to the OSDF.

D. Requests for containers shall be made to Fluor Fernald in writing at least 4 calendar days in advance of need.

PART II PRODUCTS

2.1 EQUIPMENT

A. The Contractor shall supply all equipment required for:

1. Sizing debris and moving containers within the construction zones (except End Loading Container Sea Land Boxes [ISO containers]), and

2. Loading containers.

B. Fluor Fernald will move Roll-off Boxes (ROBs) and ISO containers.

2.2 MATERIALS - FURNISHED BY OWNER (FLUOR FERNALD)

A. Fluor Fernald will provide appropriate containers for debris/waste categories as identified on the MSCC* (except liquid storage tanks, as noted in Section 01517) and as otherwise specified. These containers include, but are not limited to, the following:

Container Designation	Nominal Exterior Dimensions (H x W x L)	Maximum Gross Weight (lbs)
Large metal boxes (LMB) (top load)	8' x 8' x 20'	42,000
ISO containers (top load)	8' x 8' x 20'	42,000
ISO containers (end load)	8' x 8' x 20'	42,000
Small metal boxes	Various	8,000
55-gallon drums with lid	---	882
Roll-off boxes (ROB)	6' x 8' x 22'	42,000

B. Fluor Fernald will deliver empty ("prepped", if required) containers, pallets (possibly radiologically contaminated), dunnage, and miscellaneous materials, as required, to the container

staging (also referred to as "queuing") area.

* NOTE: The MSCC can be found in Part 6, Exhibit E

2.3 MATERIALS - FURNISHED BY CONTRACTOR

A. The Contractor shall supply fiber-reinforced polyethylene or polyester sheeting approved for outdoor storage: color, yellow; minimum thickness of 6-mils; ultraviolet resistant; as manufactured by Griffolyn, Herculite or equal.

B. The Contractor shall furnish 8" x 11" weatherproof removable tags.

C. The Contractor shall furnish 3.5'- 4' high woven metal fencing consisting of 14 gauge 2 inch x 4 inch galvanized welded mesh with 7 foot painted steel "T" posts embedded to a depth of 2 feet and placed at 10 foot intervals.

PART III EXECUTION

3.1 PREPARATION

A. Roll-Off Box Staging Area:

The Contractor shall establish and maintain a ROB staging area(s), as needed, which shall be proposed by the Contractor unless otherwise specified by Fluor Fernald on reference site drawings. To define and control access to this area, woven metal fencing will be erected around the perimeter of the staging area. One section of the fence will be open for access and egress. The fencing must be maintained in good condition. This area shall be used for temporary staging of empty and full ROB containers. If the staging area is a non-concrete surface, the Contractor shall be responsible for stabilizing and maintaining the areas and routes of access to accommodate container handling requirements.

B. Other Container Staging Areas:

The Contractor shall prepare other container staging areas as needed. Areas will either be used to store empty drums and metal boxes (includes ISO Containers), or will be used for full drums and metal boxes which shall be proposed by the Contractor (unless otherwise specified by Fluor Fernald on reference site drawings). Woven metal fencing will be erected around the perimeter of each staging area. One section of the fence for each area will be open for access and egress. The fencing must be maintained in good condition.

C. Material Inspection Area:

The Contractor shall establish a material inspection area for each contamination area, for access of Fluor Fernald personnel to inspect debris and/or perform radiological surveying. Each material inspection area shall be proposed by the Contractor and approved by Fluor Fernald. The inspection area shall be arranged such that routine access will be prevented by means of fencing and/or barrier tape, with appropriate posting to identify that the items contained are being held for visual inspection or radiological survey. The inspection area will be off-limits to individuals other than Fluor Fernald/Contractor waste technicians and radiological survey personnel.

3.2 APPLICATION

A. Debris handling requirements are defined by the following Fluor Fernald classifications: 1)non-process debris, and 2) process debris. All debris shall be sized, segregated rinsed with high-pressure water, and containerized in accordance with the MSCC.

1. Non-Process Debris:

Non-process debris will be exempt from the inspection requirement for *visible process residues* as described in Article 3.2.A.3 of this Section. Non-process debris would include, but are not limited to, piping for utility systems (i.e., steam, condensate, drinking water, air, and others), electrical systems (i.e., conduit, motors, electrical panels, and others), and obvious non-process items such as structural steel (Debris Category A), concrete (Debris Category E), transite (Debris Category G), and most miscellaneous materials categorized as Debris Category I.

2. Process Debris:

Process debris is defined as debris that fails the inspection for *visible process residues* per Article 3.2.A.3, and debris listed in the MSCC as Debris Category C.

3. Visible Process Residue Inspection Requirements:

The definition of *visible process residues* (green salt, yellow cake, black oxide, etc.) including films and precipitates is "hold-up/materials on the interior or exterior surfaces of debris that is obvious". Dirt, oil, grease, stains, rust, corrosion, and flaking do NOT qualify as visible process residues; however, dirt, oil, grease, stains, rust, corrosion, and flaking require decontamination for radiological control purposes prior to removing the debris from the enclosure or prior to opening a building to the environment, per Technical Specification Section 01517. Regardless of whether or not visible process residues are present, all debris are still considered to be radiologically contaminated unless otherwise specifically identified.

Fluor Fernald visual inspection will take place following dismantlement, sizing, and surface decontamination in accordance with Section 01517 Article 3.1, and relocation to the Fluor Fernald-approved Material Inspection Area referenced in Article 3.1.C of this Section.

a. Debris That Fails Inspection for Visible Process Residues:

Debris that fails the inspection criteria for visible process residues will be identified with yellow paint by Fluor Fernald, and the Contractor shall attempt to remove the visible process residues at least one time in accordance with Section 01517 prior to Fluor Fernald re-inspection. If the debris fails the second inspection for visible process residues, it shall be deemed as "Process Debris" (Debris Category C) and will be identified with red paint by Fluor Fernald.

b. Debris That Passes Inspection for Visible Process Residues:

Debris that passes the Fluor Fernald inspection for visible process residues shall be

rinsed with high pressure water, and containerized or staged according to Part 6, Section 8.4, and Article 3.3 of this Section.

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B. The Contractor shall be responsible for retrieving empty containers from the container staging areas (except for ISO containers), segregating debris/waste, loading, securing containers, tagging for on-site movement, and scheduling the movement of containers back to the designated container staging area. The Contractor shall use the MSCC as the basis of all containerizing activities, and shall be responsible for minimizing debris/waste generation by limiting the amount of material brought on site.

C. Equipment, material or debris requiring movement outside the enclosed building to be sized, containerized or palletized, must meet the requirements for removal/fixing of radiological contamination per Section 01517. If the removal/fixing requirements cannot be met, the material may be encapsulated or wrapped in fiber-reinforced sheeting and sealed prior to movement to prevent the migration of radioactive contamination as follows:

1. Place fiber-reinforced sheeting over pallet, position material on pallet, and wrap the sheeting over material,
2. Secure fiber-reinforced sheeting over material to prevent migration of contamination, and
3. Secure material to pallet with vinyl or metal banding material as needed.

3.3 PERFORMANCE

A. For containerization, the Contractor shall:

1. Ensure that Fluor Fernald personnel are present during the loading and securing of containers identified in the MSCC, and provide notice to Fluor Fernald within 24 hours prior to containerization.

2. Provide a debris/waste handling supervisor to supervise operations. The supervisor shall be required to complete (Fluor Fernald conducted) Nevada Test Site Waste Acceptance Criteria/Waste Certification Program Plan (NTSWAC/WCPP) training. (Note: Plans are for Fluor Fernald to develop Storage Facility WAC training, which will also be required.)

3. Segregate and containerize all debris/waste according to the categories defined in the MSCC. Should a debris/waste stream be discovered that is not on the MSCC, then work on the handling of this debris/waste shall stop, whereupon Fluor Fernald shall be contacted for further direction.

4. Commingle Debris Categories A, B, D (except for lead), and incidentally generated E in the designated container or stockpile, as directed by the MSCC. Debris Category I shall be segregated and containerized according to two subcategories: I2 - Non-compressible and/or Non-organic Misc. Debris, and I4 - Compressible and/or Organic Misc. Debris.

5. Upon receipt of containers, the Contractor shall perform a visual inspection to ensure that the containers do not contain any of the prohibited items identified in this Section, and shall complete the Project Container Arrival/Departure Inspection Checklist For Roll Off Boxes. Fluor Fernald will remove any free liquids upon removal from the work zone, as necessary.

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6. Fill containers, boxes, and drums such that the interior volume is as efficiently and compactly loaded as practical up to the maximum gross weight limit of the container. Fill void space in large piping, equipment, containers, etc., with smaller debris. Any container exceeding maximum allowable gross weight shall have contents removed, as required, to lower the weight to an acceptable range. Contents shall be prepared for containerization in order to minimize load shifting or damage to container during movement.

7. Ensure that except during loading activities, empty metal boxes and drums must remain in the established empty container staging area.

8. Ensure that the following "Prohibited Materials List" is displayed in the containerization area or on each container. Notify Fluor Fernald if any of the prohibited materials are identified for specific material handling directions.

PROHIBITED MATERIALS LIST

a. Gas cylinders that are able to be pressurized
b. Explosives
c. Materials containing free liquids. The intent of the exclusion of free liquids is to prevent contaminated liquid waste (e.g., a drum of solvent) from being directly disposed of in the On-Site Disposal Facility (OSDF). Materials that contain rainwater or that have an inherent moisture content (e.g., sludge) are not excluded.
d. Fine particulates (respirable fines)
e. Hazardous waste (Characteristic or Listed)
f. Corrosive materials
g. Etiologic agents
h. Flammable liquids or combustible solids
i. Whole or shredded scrap tires
j. Material from any off-site source, including any other DOE site
k. Product, residues, and other special materials (Category J materials)
l. Process-related metals (Category C)
m. Intact containers (i.e., containers must be empty and crushed)
n. Acid brick (Category F material)
o. Transformers, which have not either been crushed or had their void spaces filled with grout
p. HEPA filters
q. Used oils
r. Materials not accompanied by a manifest
s. Solvent saturated soils
t. Material not meeting physical WAC

9. Install weatherproof removable tags on each debris/waste container prior to loading. Tags shall identify container contents, using indelible ink, by debris/waste category specified in the MSCC and the debris/waste's building of origin. For Category J Debris, an exact description of the contents is required.

10. Containerize Thorium contaminated debris/waste separately from non-Thorium contaminated debris/waste.

B. Security and Movement of Containers: 3873

To ensure security and movement of containers, the Contractor shall:

1. Schedule the movement of containers to the specific task location from the container staging area.

2. Ensure that the lid, doors, or tarps on debris/waste containers are secured when no containerization is in progress to prevent unauthorized containerization of materials or release of container contents. Containers must be weather protected when lid is not secured, to prevent entry of snow and rain or release of container contents.

3. Inspect all containers, double bagged materials, drums, boxes, or double wrapped components for exterior contamination and damage before removing them from the work area. Damaged containers shall be reported to Fluor Fernald. Any container damage beyond normal wear and tear that is Contractor-caused shall be the Contractor's responsibility to repair or to provide compensation for such repairs.

4. Secure full containers.

   a. End-loading ISO containers shall be secured by closing and latching doors, ensuring that all latching mechanisms are engaged.

   b. Drums shall be secured as follows:

      1. Place lid on drum, ensuring that gasket is seated to maintain a tight seal,
      2. Install bolt-type lock ring on lid and torque to 45 ∀ 5 foot-pounds, and
      3. Drums shall be securely strapped together on pallets, using at least one strap.

   c. Top-Loading Metal boxes (large and small) shall be secured as follows:

      1. Inspect gasket for damage and repair, if required, and
      2. Place gasket and lid on the box and secure with clamping device or pins.

   d. Roll-Off Boxes (ROBs) shall be secured as follows:

      1. Cover ROB with tarp or steel lid,
      2. Secure tarp (with straps) or steel lid (with clamping device or pins),
      3. Secure all gate chains, and
      4. Ensure that containers have not been damaged during loading.

   e. Prior to securing lid or doors on containers holding asbestos-containing materials (ACM), fold fiber-reinforced sheeting over ACM and seal with tape.

   f. Return full, secured containers to the staging area (except for ISOs, which will be removed by Fluor Fernald).

   g. Filled ROBs must remain inside the established staging area until they can be removed by Fluor Fernald.

h. Filled drums and metal boxes must remain inside the established full container staging area until they can be removed by Fluor Fernald.

i. The Contractor shall decontaminate waste containers, equipment, tools, etc., prior to exiting the construction zone or staging area as necessary in accordance with Section 01519.

C. Stockpiling of Materials:

1. The Contractor shall establish/construct and manage debris stockpile area(s) on concrete or asphalt surfaces with run-off controls (as required by Section 01515), and fencing. The Contractor shall ensure that run-off controls are constructed and used in accordance with Section 01515. Stockpiled materials shall be sized and segregated in accordance with the MSCC. A five foot buffer area shall be maintained between the footprint of the stockpile(s) and the perimeter of the pad(s) and the stockpile area fencing. The Contractor shall inspect the stockpile area(s) and report any deficiencies to Fluor Fernald. Inspections shall be documented in the Contractor's Daily Work Activities Report and shall include at least the following:

   a. Daily and after storm events with heavy rains and/or strong winds to ensure that piles remain in a safe and controlled configuration,
   b. Covers of catch basins to ensure that they remain unclogged and free of obstructions,
   c. Diking to ensure that controls are in good condition, permitting easy flow of runoff, and
   d. Perimeter fencing, gates, and other materials required for maintaining project control of the stockpile area(s).

2. Fluor Fernald will perform routine radiological contamination surveys and airborne radioactivity monitoring, as deemed to be appropriate. If deemed necessary by Fluor Fernald, the Contractor shall take measures to mitigate the spread of contamination to areas outside of the staging area and to maintain airborne radiological levels within allowable limits. These measures may include area decontamination, application of fixatives, or other measures proposed by the Contractor and accepted by Fluor Fernald.

3. Floor Load Capacity:

   If the Contractor chooses to stage any debris on a floor other than a slab-on-grade, a structural engineering analysis shall be required. It shall be the Contractor's responsibility to perform the analysis to verify the loading capacity of said floor and submit the analysis to Fluor Fernald, signed and stamped by a Professional Engineer (PE) registered in the State of Ohio, to ensure that the load capacity is not exceeded.

D. Collection and Containerization of Controlled Area Office Trash from Contractor-Owned Office Trailers

Office trash from Contractor-owned office trailers shall be collected and managed in accordance with the following requirements:

1. Collect office trash from Contractor-owned office areas for participation in the controlled area office trash program.

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2. Prohibited items, items that are suspected to be contaminated, or items not normally discarded into office area trash containers shall be segregated from typical office trash. Prohibited items include, but are not limited to: tools, equipment, mop heads, hose clamps, floor sweepings, aerosol cans, high density material, protective clothing (Anti-C's, gloves, booties, coveralls), yellow maslin, yellow tape/RadCon tape, yellow herculite, yellow shoe covers, radiological smears, radiological safety signs, plastic sample bottles, and instrument survey cords.

3. If any prohibited or suspect materials are found (with the exception of tools and equipment), they shall be disposed of as contaminated material in accordance with the MSCC.

4. If tools or equipment are found in office area trash containers, contact the Fluor Fernald Construction Manager for radiological evaluation and the procedure for decontamination or disposition.

5. Package office trash in green tinted translucent plastic bags provided by Fluor Fernald. These types of bags are exclusive for the Controlled Area office trash disposal program.

6. Seal each clear trash bag and green trash bag with tape (not yellow in color) and indicate the building or area where the trash was generated directly on each trash bag with a paint stick or permanent marker.

7. Place office trash in a designated area agreed upon by Fluor Fernald and the Contractor. Fluor Fernald will collect office trash daily, unless stated otherwise by the D&D Contract.

3.4 QUALITY ASSURANCE

The Contractor and Fluor Fernald shall inspect filled containers upon their return to the container staging area to verify that no damage has occurred during the filling of the container.

END OF SECTION

Approved: _____ 9/4/01
Joseph S. Stoner Date

SECTION 01515

MOBILIZATION, DEMOBILIZATION AND GENERAL SITE REQUIREMENTS

PART I GENERAL

1.1 SCOPE

This Section consists of the work related to Contractor mobilization, demobilization, and general site requirements. The principal items included in this Section are:

A. Site access,
B. Slab Repair,
C. Construction utilities,
D. Signs and barriers,
E. Potential use of existing overhead bridge cranes,
F. Gravel pads for access and queuing areas,
G. Protecting adjacent facilities and components,
H. Stormwater control,
I. Debris chutes,
J. Remediation equipment, and
K. Ventilation and containment.

1.2 RELATED SECTIONS

A. Section 01120 - Debris/Waste Handling Criteria
B. Section 01519 - Decontamination of Contractor Provided Tools, Equipment and Materials
C. Section 03315 - Concrete/Masonry Removal
D. Section 05126 - Structural Steel Dismantlement
E. Section 07415 - Transite Removal
F. Section 15065 - Equipment/System Dismantlement
G. Section 15067 - Ventilation and Containment

1.3 REFERENCE MATERIALS

Fluor Fernald will provide access to existing site drawings at the Fluor Fernald offices located at:

175 Tri-County Parkway
Cincinnati, OH 45246-3222

Drawings will be provided on an information only basis.

1.4 REFERENCES, CODES AND STANDARDS

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The entire work under this Section shall be in compliance with the provisions of the following:

A. American Society of Testing and Materials (ASTM):

1.	ASTM A36	Standard Specification for Carbon Structural Steel
2.	ASTM C109-93	Standard Test Method for Compressive Strength of Hydraulic Cement Mortars
3.	ASTM C136-93	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates (AASHTO T27)
4.	ASTM D698-91	Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbs/ft.)
5.	ASTM C1042-91	Standard Test Method for Bond Strength of Latex Systems Used with Concrete by Slant Shear

B. National Fire Protection Association (NFPA):

1.	NFPA 70	National Electrical Code, 1996 Edition
2.	NFPA 101A-98	Code for Life from Fire in Buildings and Structures

C. American National Standards Institute (ANSI):

1.	ANSI C2-93	National Electrical Safety Code
2.	ANSI C135.1-79	Galvanized Steel Bolts and Nuts for Overhead Line Construction
3.	ANSI 05.1-92	Wood Poles Specifications and Dimensions

D. American Wood-Preservers Association (AWPA): AWPA C4-95 Poles, Pressure Treatment

E. National Electrical Manufacturers Association (NEMA):

1.	NEMA LA 1-92	Surge Arresters
2.	NEMA WC 7088	Cross-Linked-Thermosetting Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy

F. Underwriters Laboratories (UL):

1.	UL 96-94	UL Standard for Safety Lightning Protection Components
2.	UL Electrical Directories, 1995 Construction Materials	

G. United States Department of Agriculture, Soil Conservation Service: Water Management and Sediment Control in Urbanizing Areas.

H. Code of Federal Regulations (CFR):

1.	29 CFR 1926	Occupational Safety and Health Administration, Dept. of Labor (as applicable)
2.	29 CFR 1910	Occupational Safety and Health Administration, Dept. of Labor (as applicable)

I. American Water Works Association (AWWA): AWWA C506-78 C Backflow Prevention Devices-Reduced Pressure Principle and Double Check Valve Types

J. Ohio State Plumbing Code: 4104:26:105 Backflow

1.5 SUBMITTALS

The Contractor shall submit a Mobilization Safe Work Plan for approval by Fluor Fernald that shall include the following:

A. Drawings and Data:

1. Detail and layout drawings showing locations of any barriers and/or fencing the Contractor will use for construction zones, radiological control boundaries, container staging areas, debris stockpiling areas, and barriers to be used for protection of adjacent structures.

2. Detail and layout drawings showing temporary structures, access and roadways required during mobilization of major equipment components (e.g., cranes, field offices, tool and equipment storage, chutes within the stated limits of the construction zone). This shall include personnel and flow patterns into and within the construction zone.

3. Drawings showing layout, details and applicable equipment, or plans the Contractor will employ to control fugitive emissions, storm water runoff, erosion, and migration of liquids.

4. Detail and layout drawings showing lay down areas, building vestibule sizes and locations, cutting areas and, as required by Section 01120, container staging areas, material inspection area, and debris stockpiling area(s).

5. Shop drawings for all debris chutes to be used.

   a. Provide manufacturer's data or calculations to verify that the chute, its support system and the existing structure (if the debris chute is attached) can withstand all dynamic impact loads they will be subjected to during dismantlement operations.

   b. Debris chute drawings and calculations submitted must bear the stamp of a Professional Engineer registered in the State of Ohio.

B. Temporary utilities (such as water, steam, electric power) from the point source location to end use locations, as identified on the reference site drawing.

C. Portable heating systems.

D. Verification that the patching grout compressive and bond strengths are in accordance with ASTM C109 and ASTM C1042, respectively.

E. Results of the Engineering Survey per 29 CFR 1926.850 (If any building or if part of a building to be dismantled is identified in the Contractor's engineering survey as being structurally deficient, the Contractor shall include in the Safe Work Plan proposed methods to shore the structure so that safety of the workers is maintained)

F. Written statement that Contractor accepts that all electric, gas, water, steam, sewer, and/or other service lines to the structures have been disconnected and/or capped.

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PART II PRODUCTS

2.1 MATERIALS

A. Patching Grout: Non-shrink type, premixed compound consisting of non-metallic aggregate; cement; water reducing and plasticizing agent; capable of developing minimum compressive strength of 5,000 psi in 28 days; capable of developing a bond strength of 1,200 psi in 28 days; conforming to ASTM C 109 and ASTM C827.

1. Acceptable products and suppliers:

   a. Masterflow 713, by Masters Builders
   b. SikaGrout 212, by Sika Corp
   c. Sealtight 588, by W. R. Meadows
   d. Approved equal

2. The "approved equal" products shall be approved by Fluor Fernald prior to use on the FEMP.

B. Construction Zone fencing shall meet the requirements for permanent fencing in Article 2.1.C. Gates shall be plastic yellow chain fixed to stanchions. Stanchions shall be located on grade.

C. Permanent Fencing: Permanent fencing shall be a distance of 10 feet outside of the areas to be protected and shall consist of 14 gauge 2"x4" galvanized welded wire mesh 48" high with 7 foot painted steel "T" posts embedded to a depth of 2 feet and placed at 10 foot intervals.

D. If filling of slab openings is required per Article 3.2.B of this Section, clean granular fill is used to fill large openings in the base slab, including pits, large sumps, etc. The Contractor will supply this material. Use of fine aggregate shall be natural river sand, bank sand or sand manufactured from stone or air-cooled blast furnace slag; washed; free of silt, clay, loam, friable or soluble materials, and organic matter; within the following limits:

Sieve Size	Percent Passing
No. 4	100
No. 50	10 - 40
No. 200	0 - 5

E. Gravel Pads for Access and Container Staging Areas

The aggregate shall be 6 - 8 inches (i.e., aggregate size) crushed limestone or gravel and compacted to form a 12 inch base.

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F. Wood Utility Poles:

1. ANSI 05.1; treated southern pine poles.
2. Select poles for straightness, minimum sweeps and short crooks. Fluor Fernald shall be notified of any sweeps or crooks prior to installation for determination of acceptance.
3. Preservative: ANSI 05.1 and AWPA C4, Pentachlorophenol.
4. Apply preservative to AWPA C4 with minimum net retention of 12 lbs/ft^3 (285 kg/m^3). Obtain complete sapwood penetration.

G. Pole Hardware:

1. Miscellaneous Pole Hardware: Hot-dipped galvanized after fabrication
2. Bolts and Nuts: ANSI C135.1
3. Butt Plate: Copper
4. Guy Strand: High strength, seven strand steel cable galvanized to ASTM A475, Class A or B
5. Guy Termination: Preformed dead-end grip clamp type
6. Guy Guards: 8 foot (2 m) long plastic, colored yellow
7. Ground Wire: Soft drawn copper conductors, 6 AWG minimum size
8. Air Terminal: UL 96; 18 inch copper air terminal
9. Guy Adapter: Twin or Triple Eye

H. Line Conductors:

Secondary Conductors: Aluminum or copper, triplex (three) cable with 600 volt cross-linked polyethylene insulation for phase conductors. Use bare messenger for grounding conductor.

I. Arresters:

1. Surge Arresters: NEMA LA 1; valve type, arranged for pole mounting, and rated 3 kv.
2. Mechanical Connectors: Bronze
3. Wire: Stranded copper
4. Grounding Conductor: Size to meet NFPA 70 requirements

J. Pole Anchors: Helical screw anchor type sized for load; galvanized steel; ASTM A36/36M

K. Backflow Prevention for Temporary Water Conditions (Reduced Pressure Type):

1. The backflow preventor shall meet Ohio State Plumbing Code 4101:26:105 Backflow and the American Water Works Association (AWWA) Standard (AWWA C506-78) for Backflow Prevention Devices.

2. Acceptable products and suppliers:

   a. WATTS 909 Backflow Preventor (Fluor Fernald recommended product)
   b. Approved equal

L. Portable Heating Systems: All portable heaters shall be Underwriters Laboratories (UL) listed or American Gas Association (AGA) certified for their intended use, and are not modified for other applications.

M. Materials Supplied by Owner:

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Fluor Fernald shall supply signs, barriers, fencing, and tape indicating radiological control zones for Contractor installation.

N. Materials Supplied by Contractor:

The Contractor shall supply all materials (other than those listed in M. above) required for mobilization, demobilization, and other site requirements identified herein.

2.2 EQUIPMENT

The Contractor shall supply all equipment necessary for mobilization, demobilization, and other site requirements.

2.3 UTILITIES

Fluor Fernald will provide electrical power and water according to Part 6, Section 7.

PART III EXECUTION

3.1 EXAMINATION

The Contractor shall perform an Engineering Survey in accordance with the requirements of OSHA 29 CFR 1926.850 and obtain approval from Fluor Fernald prior to mobilization.

3.2 PREPARATION

A. Site Access:

1. Vehicle, equipment and pedestrian access/egress shall be directed through the designated radiological control points.

2. Provide for emergency vehicles to enter the construction zone at all times.

B. Slab Repair:

1. Except for areas noted on the Civil Demolition Plan drawing which require permanent fencing to prevent access to particular subsurface voids (e.g., basements, pits, trenches), the Contractor shall fill large openings(e.g., pits, sumps, etc.) with granular fill material to within 2 inches of grade. Alternatively, the Contractor may propose to use engineered covers that are capable of supporting anticipated loads during D&D. Fluor Fernald shall approve alternatives.

2. Portions of the building slab, which are not identified inthe Civil Demolition Plan drawing as areas to be protected with permanent fencing are potential locations for interim storage stockpiling of contaminated debris or for staging of contaminated equipment. In those areas, the slab openings (conduit, piping, drain openings, etc.) shall be filled and covered with patching grout. Additional requirements for potential stockpiling areas include the following:

a. Drain water and remove loose debris from large openings in the base slab including pits, sumps, trenches, etc., prior to filling.

b. All grease, oil, dirt and other deleterious materials shall be completely removed from slab openings and handled in accordance with Section 01120.

c. Follow the manufacturer's recommendations for the application of patching grout.

d. Fill in damaged areas of base slab and small openings including drains, chases, small sumps, etc., with a patching grout to create a surface level with surrounding slab. Maximum allowable depression not requiring repair is 1 inch in depth.

e. Concrete reinforcements, such as rebar, shall be cut flush with the slab.

C. Construction Utilities:

1. Prior to mobilization, the Contractor shall conduct a physical survey to verify that all utilities are capped and/or controlled to the Contractor's satisfaction.

2. The Contractor shall determine if the capacities that can be provided by Fluor Fernald are adequate for their needs; if not, the Contractor shall notify Fluor Fernald in writing of needs for evaluation.

3. All electrical appurtenances required for temporary power shall be in accordance with the National Electric Code.

4. Temporary heating or cooling, if needed, shall be provided by the Contractor. Ventilation for fuel-fired heaters and adequate clearance to combustible materials, surfaces, and furnishings shall be provided according to manufacturer's recommendations. Use of LPG gas-fired heaters shall be approved by Fluor Fernald. All portable continuous running of gas fired heating systems require 24 hour coverage by the Contractor.

5. The Contractor shall extend construction water from the point source location to support operations or provide portable facilities. Tie-in to water point source shall require a backflow preventor in accordance with the Ohio State Plumbing Code, as referenced in Article 1.4. Installation, maintenance, and inspection of the backflow preventor shall be by a licensed plumber and certified in the State of Ohio as a Backflow Preventor Tester.

   The individual who provides only the hook-up of a backflow preventor need not be a certified and licensed plumber provided that the hook-up is inspected by a certified and licensed plumber prior to system operation.

   a. The Contractor shall supply, install, and maintain all backflow prevention devices (in accordance with Article 2.1 of this Section), fittings, and valves for point source connections.

      1. The contractor shall provide Fluor Fernald with the backflow prevention device at least two weeks prior to installation for inspection.

      2. Fluor Fernald will test and approve the backflow preventor for contractor installation.

b. Every 12 months after installation, Fluor Fernald will inspect the assemblies. The Contractor shall coordinate water hook-up with Fluor Fernald. Fluor Fernald will activate hydrants.

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c. At project completion, the Contractor shall turn all backflow prevention devices, fittings, and valves over to Fluor Fernald in good working order at no additional costs.

d. Backflow devices shall have freeze protection and be accessible for inspection.

D. Signs and Barriers:

1. The Contractor shall protect manholes, catch basins, valve pits, underground utilities, post indicator valves, power poles and drains, adjacent structures, groundwater monitoring wells, existing exterior benchmarks, and survey monuments from damage. If any signage or fencing is displaced or lost, the Contractor shall reinstall at no additional cost to Fluor Fernald.

2. FDF has installed construction zone fencing outlining the construction boundaries. If modifications to the fencing are required, the Contractor shall install per 2.1.C. The Contractor shall post construction safety signs at 50 feet intervals around the defined construction area. Fencing must be supported by posts driven into the ground. The Contractor shall regularly inspect all fences and barriers for integrity in a prompt manner throughout the D&D project and repair as necessary.

3. The fencing described in 3.2.D.2 may serve as both a construction work zone boundary fence and the radiological control fence in outdoor areas. However, the Contractor shall install additional radiological control fencing as required to delineate areas discussed below. The preferred fencing is as per 2.1.C; however, yellow snow fence may be used.

   a. The yellow fencing shall be used to designate the following boundaries:

      1). Contamination Area/Controlled Area;

      2). High Contamination Area/Contamination Area;

      3). Adjacent Contamination Areas controlled for different radionuclides; and/or

      4). Any other boundaries between different levels of radiological control.

   b. Existing physical barriers, such as permanent fences or building walls, may serve as part of the radiological boundary where appropriate.

4. Fencing for short-term work, i.e., work within the project construction zone boundary, may be supported with portable stanchions placed at no more than six feet apart. Entry points shall be established such that they may be easily opened and can be held closed. These points shall be large enough to support traffic and/or movement of waste containers. For situations where personnel access is the only need, the Contractor may utilize building doors or overlapping yellow fence that can be tied back and supported by the remaining fence while open (i.e., will not lie on the ground).

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5. Permanent Fencing: Upon completion of D&D activities, the Contractor shall install permanent fencing around specific areas as identified on the Civil Demolition Plan drawing. Article 2.1.C of this Section defines the material and placement specifications. An access gate, using the same fence material, shall be installed at one location along the perimeter fencing of the area to allow subsequent access by Fluor Fernald. The gate shall have a latch that can be locked.

E. Potential Use of Existing Overhead Bridge Cranes:

Use of permanent facilities shall be in accordance with the requirements specified in the provisions for Temporary Facilities and Utilities located in Part 6, Section 7. Existing Overhead Bridge Cranes or other existing hoisting devices shall not be allowed without prior approval from the Construction Manager.

F. Gravel Pads for Access and Queuing Areas:

Grading of site shall prevent ponding of water. Use a minimum slope of 1 percent. All grading will direct water toward the site's storm drainage system.

G. Stormwater Control:

Storm water control will be required for activities that could disturb soils or otherwise allow for release of contaminants from stockpiled debris. Storm drainage systems within the construction zone shall be maintained free and clear of debris and sediments by use of control devices, such as staked silt fences, and be maintained throughout the project. Hay/straw bales are not acceptable control devices.

H. Debris Chutes:

1. The Contractor shall ensure that catch platforms, chutes and other means of handling debris are properly isolated by gates or barriers designed and constructed to eliminate impact hazards and to control the flow of material to its final destination.

2. Debris chutes shall meet the requirements of 29 CFR 1926.852.

3. Debris chutes shall be fully enclosed, dust-tight and ventilated.

4. Fluor Fernald may prohibit the use of a debris chute if the radiological contamination levels could result in the uncontrolled generation of airborne radioactivity.

I. Remediation Equipment:

1. Identify any special requirements for storing material or equipment.

2. To minimize the generation of waste products by the Contractor, all equipment requiring periodic oil and filter changes shall have this maintenance performed just prior to arrival on site.

3. Additional requirements for mobilization and demobilization of remediation equipment are listed in Part 8, Section B.12.

J. Ventilation and Containment: 3873

1. If release cleaning for structures is required, as specified in the Radiological Requirements Plan contained in Part 8, Section C 2.0, a vestibule on the entry/exit of the building access prior to the beginning of work shall be installed. The vestibule shall be constructed so as to prevent the escape of airborne contamination. Material used for the construction of vestibules shall be in compliance with Section 15067.

2. Enclose structure and ensure that all holes, gaps, openings in exterior building structure walls and roofs are sealed with duct tape, fiber-reinforced sheeting, plywood or foam material (including where doors or windows are missing) in accordance with Section 15067. Enclosed structures shall allow for emergency exits.

3.3 DEMOBILIZATION AND FINAL PROJECT SITE ACCEPTANCE

A. Demobilization includes the decontamination and removal of all contractor tools, equipment, facilities, materials, and construction zone perimeter fencing.

B. Final project site acceptance shall be conducted by Fluor Fernald, and will consist of verification of completion of all work activities relating to the work scope.

END OF SECTION

Title: Demolition Closure Project	Specification No: 01789-TS-0001		
	Date: 09/04/01	Section 01516	Rev 0

Approved: Joseph S. Stoner 9/4/01
Date

SECTION 01516

ASBESTOS ABATEMENT

PART I GENERAL

1.1 SCOPE

This Section specifies the requirements for an asbestos abatement program; methods to be used for removal, movement, and disposition of friable asbestos-containing material (ACM); and other materials contaminated with asbestos. This Section does not cover transite unless panels exhibit significantly deteriorated surfaces where surfaces become friable.

1.2 RELATED SECTIONS

A. Section 01120 - Debris/Waste Handling Criteria
B. Section 01517 - Removing/Fixing Radiological Contamination
C. Section 07415 - Transite Removal
D. Section 15067 - Ventilation and Containment

1.3 REFERENCE MATERIALS

A. See Part 7 for the following:

1. Index of Drawings
2. Photographs
3. Drawings
4. Air Filter Device (AFD) Procurement Specification
5. Air Cleaning Filter Procurement Specification
6. Contractor Safe Work Plan Format Requirements
7. HEPA Vacuum Cleaner Requirement
8. HEPA Air Filtration Device Requirement

B. ACM summary information on the project is provided in Part 6, Exhibit F; however, the contractor is responsible for estimating quantities for bid/proposal and regulatory purposes.

1.4 REFERENCES, CODE AND STANDARDS

A. 29 CFR 1910 Occupational Safety and Health Administration - Dept. of Labor (as applicable)
B. 29 CFR 1926 Occupational Safety and Health Administration - Dept. of Labor (as applicable)
C. Ohio Department of Health Asbestos Hazards Abatement Rules Chapter 3701 - 34, OAC (Ohio Department of Health)
D. Ohio Environmental Protection Agency Chapter 3745-20, OAC

E. United States Environmental Protection Agency (U.S. EPA) 40 CFR 61, Subpart M, (NESHAPS)

1.5 SUBMITTALS

The Contractor shall submit to Fluor Fernald the following for approval:

A. An Asbestos Abatement Safe Work Plan, prepared by an Ohio Certified Asbestos Abatement Project Designer, in accordance with Part 7, ACR-002, Contractor Safe Work Plan Format Requirements, and Part 8, Section B.3.3 - Asbestos Abatement Safe Work Plan Requirements and Safety and Health and Training Requirements. Included are the procedures proposed for use in complying with the requirements of this Section.

B. Prior to initiation of ACM work, the Contractor shall submit the following items to Fluor Fernald:

1. Ohio Department of Health/OSHA-required documentation for Asbestos Removal Contractors:

   a. Documentation of training
   b. Medical surveillances
   c. Respirator fit-test
   d. Employee exposure assessments

2. State of Ohio certificates and licenses for the Contractor

3. State of Ohio certification for all personnel as required by law

C. Two (2) weeks or ten (10) working days (minimum) prior to submittal of notification to government agencies, the Contractor shall provide a copy of the notification to Fluor Fernald for concurrence.

D. Product Data: The Contractor shall submit manufacturer's technical information including application instructions for each material proposed for use.

1.6 PROJECT CONDITIONS

1. Transite that has deteriorated to a friable condition shall be considered friable ACM and therefore be removed in accordance with this Section.

2. ACM-containing materials such as floor tile, mastic, woven cloth-covered electric wire, and gaskets may become friable during handling; therefore, such materials shall be removed pursuant to the requirements of this Section.

PART II PRODUCTS

2.1 MATERIAL

A. Polyethylene sheeting: Fire retardant, clear, and have a minimum of 6 mils thickness as manufactured by Blueridge Films, Inc. or equal.

B. Polyethylene bags: clear and have a minimum of 6 mils thickness.

C. Outside containments: Clear, reinforced and have a minimum of 6 mils thickness as manufactured by Blueridge Films, Inc. or equal.

D. Surfactants (wetting agents), encapsulants, and lockdowns shall be mixed in a proportion specified by the manufacturer, applied according to manufacturer's specifications (including temperature), and contain a colorant to make coverage areas readily apparent. Products that have been acceptable to Fluor Fernald include those listed below. Equivalent or better products may be acceptable and shall be approved by Fluor Fernald.

1. Surfactants:

   a. CP-225 CHIL-SORB by Childers
   b. Approved equal

2. Encapsulants/Lockdowns:

   a. Control – Grayling Ind.
   b. Foster 32-60 – Foster Products Corp.
   c. Fiberset PM – Fiberlock Technologies
   d. ACC 22-P – American Coatings Corp.
   e. Serpiloc
   f. Approved equal

3. Bridging Encapsulants:

   a. Asbestos Binding Compound – Fiberlock Technologies
   b. Leadlock – Global Encasement Systems
   c. Foster 32-80, Foster Products Corp.
   d. Approved equal

E. Materials shall be in original, new, and unopened containers bearing manufacturer=s name, label, and the following information:

1. Name or title of material
2. Manufacturer=s stock number and date of manufacture
3. Manufacturer=s name
4. Thinning instructions
5. Application instructions

2.2 EQUIPMENT

A. Negative pressure Air Filtration Device (AFD) equipped with HEPA filtration and operated in accordance with the requirements of 29 CFR 1926.1101.

B. All containments used for asbestos abatement operations shall be capable of maintaining a minimum of 0.02 inches water gauge (w.g.) of negative pressure, as recorded by manometric measurements. The ventilation system for this type of operation shall provide a minimum of

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four air changes per hour.

C. For mini-enclosures and glovebags, a HEPA filtered vacuum system may be substituted to provide negative air pressure. Ensure that the HEPA filtered vacuum system meets the four air changes per hour capacity required for mini-containments.

D. HEPA filtered vacuum.

E. The Contractor shall supply a Portable Asbestos Hygiene Facility (see Figure 1). The size of this facility shall be large enough to handle the asbestos workers during peak manpower periods. The facility shall meet the requirements for a hygiene facility specified by OSHA 29 CFR 1926.1101, DOE and site radiological control requirements. It shall be constructed using fire retardant material. When exiting a radiological contaminated area, whole body monitoring is required prior to showering.

The requirements for hygiene facility compliance with radiological controls are as follows:

1. The asbestos hygiene facility shall be located adjacent to the radiological contamination area. The size of this facility is based on the number of employees that will be using the facility; this determines the number of showers required. The minimum number of showers required (based on number of workers) is located in 29 CFR 1910.141, Sanitation. It is recommended that the Contractor provide more showers than are legally required so the workers can exit the work area in a timely manner.

2. The doffing room shall be divided into two areas, the Equipment Area and the Buffer Area, and the equipment area shall be maintained under negative pressure relative to the rest of the asbestos hygiene facility.

3. The Equipment Area will be considered a radiological contaminated area. The air in the dirty change area shall be exhausted through a HEPA filtered air filtration device to assist in cleaning the air in the change area. The air change requirement in the dirty change area is 4 air changes per hour at a minimum of -0.02 inches of water pressure differential, relative to outside pressure. The dirty change area shall be large enough to accommodate four containers for segregation of asbestos contaminated waste and personal protective equipment, and an Air Filtering Device. The dirty change area shall have hooks or shelves for storage of hardhats and toolbelts.

4. A step-off pad will be established in the airlock/doorway separating the radiological contaminated area from the radiological controlled area creating a boundary for control of asbestos contaminated items and radiological contamination. The second area in the doffing room (Buffer Area) will be a radiologically controlled area, which should be maintained free of any asbestos or radiological contamination. The Contractor shall ensure that an electrical outlet exists for the PCM. The minimum power requirements for the PCM are 120 volts AC and 1 amp. The PCM minimally requires an area of 5.5 feet by 4 feet by 8 feet in height. The buffer area shall also contain a sink with a spray attachment for the rinsing of respirators prior to doffing.

5. Water shall be collected from the shower room and the buffer area sink, and be filtered down to 5 microns for asbestos fibers prior to discharge to the site wastewater treatment facility.

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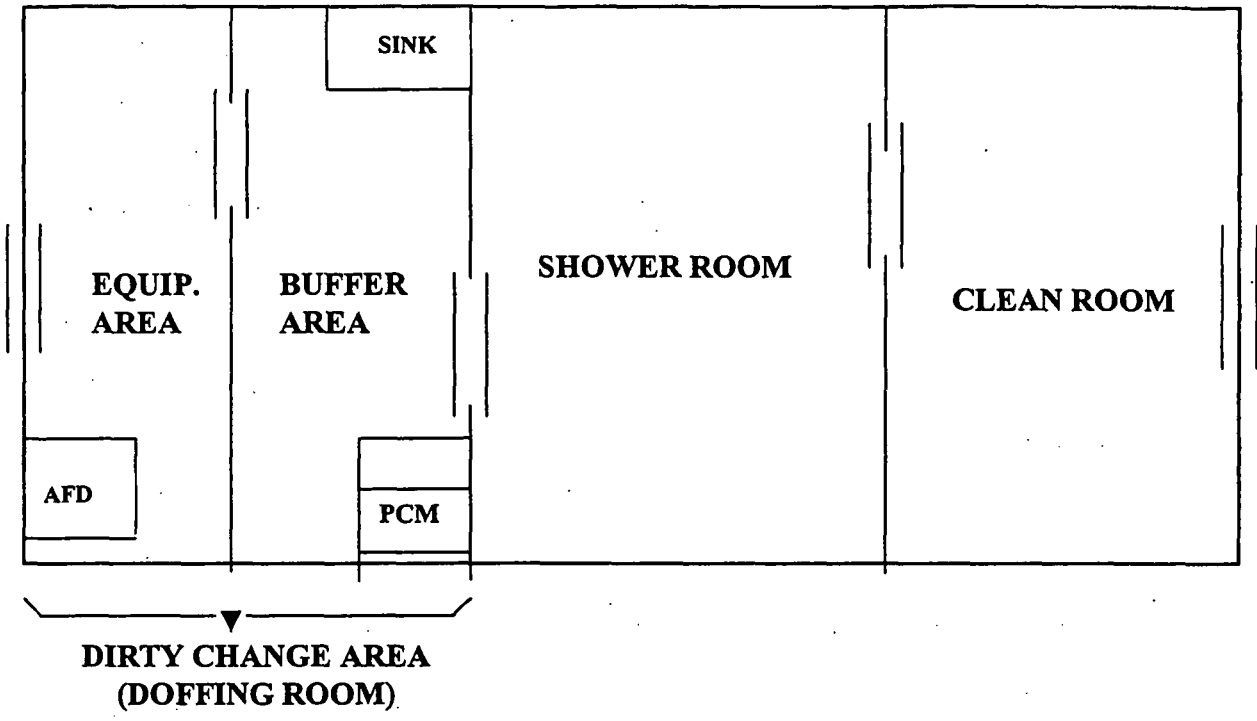
6. The clean room shall contain benches, lockers for storage of workers= personal clothing, and shelves for storage of personal protective equipment.

FIGURE 1 ASBESTOS HYGIENE FACILITY (EXAMPLE)



PART III EXECUTION

3.1 PREPARATION

A. Regulatory:

The Contractor shall:

1. Notify the Ohio Department of Health (ODOH) ten (10) working days or two (2) weeks prior to start of ACM removal; coordinate with Fluor Fernald prior to submitting ODOH notification (Note: Fluor Fernald will be responsible for notifying the EPAs and all other applicable governmental agencies before start of work).
2. Comply with work practices and procedures set forth in all applicable Federal, State, and local codes, regulations, and standards.
3. Obtain certifications and licenses.
4. Take precautions to prevent creation of friable ACM during handling.

B. Work Area (for containment work):

1. Isolate the work area
2. Establish hygiene facility/equipment room
3. Install primary containment barriers
4. Cover the floor with two layers of 6 mil polyethylene sheeting

5. Size plastic to minimize seams
6. Cover walls and any contained work area with 6 mil polyethylene sheeting
7. Provide load out facility and emergency exits
8. Post the required asbestos hazard warning signs

C. Work Area (for glove-bag/wrap and cut removal):

1. Isolate work area
2. Establish hygiene facility/equipment room
3. Install work area barriers
4. Cover the floor with one layer of 6 mil polyethylene sheeting
5. Post the required asbestos hazard warning signs

D. Work Area (floor tile removal)

1. Isolate work area
2. Establish hygiene facility/equipment room
3. Install critical barriers
4. Post the required asbestos hazard warning signs

3.2 APPLICATION

A. Wet methods and engineering controls/containment shall be utilized throughout abatement activities to prevent employee exposure as well as the release of visible asbestos emissions to the environment.

B. Removal procedures:

1. Wet all ACM to be removed with amended water solution.

2. Saturated ACM shall be removed in manageable sections and maintained wet until placed into disposal containers or sealed in 2 layers of clear 6-mil plastic.

3. Material removed from building structures or components shall not be dropped or thrown to the floor or into disposal containers.

4. Large components removed intact may be wrapped in two layers of clear 6-mil polyethylene sheeting, secured with tape and properly labeled. All piping (less than 12 inches in diameter) insulated with ACM may be removed with ACM in place. Wrap the piping with two layers of clear 6-mil polyethylene sheeting. Remove ACM from area of cut utilizing glovebags as containment. Exposed ACM ends shall be capped and the pipe shall be wrapped in clear 6-mil polyethylene sheeting. Containerize according to the Waste Management Plan, located in Part 6, Exhibit E.

5. Asbestos-containing material with sharp-edged components (e.g., nails, screws, metal lath, tin sheeting) which will tear the polyethylene bags and sheeting shall be placed into Contractor-supplied, properly labeled containers, and subsequently bagged for disposal. These containers are required to be "see-through", so Fluor Fernald personnel can visually inspect contents. When bagging floor tile, ensure that waste bags are not overloaded such that the weight makes them difficult to handle.

6. After completion of all stripping work, surfaces from which ACM has been removed shall be wet-brushed and sponged or cleaned by some equivalent method to remove all visible ACM residue.

C. Cleanup procedures:

1. Remove and containerize all visible accumulations of ACM and asbestos-contaminated material.

2. HEPA vacuum and wet clean all surfaces in the work area.

3. For containment work, after cleaning the work area, wait at least 24 hours to allow fibers to settle, and HEPA vacuum and wet clean objects and surfaces in the work area again.

4. Inspect the work area for visible residue.

5. The work area shall be cleaned until visual inspection reveals no evidence of any ACM as determined by Fluor Fernald.

6. Apply lockdown to all surfaces in the work area.

7. For containment work, aggressive clearance testing shall be performed by Fluor Fernald and the acceptable limit shall be <0.01 f/cc by Phase Contrast Microscopy.

8. Upon successful completion of aggressive clearance testing by Fluor Fernald, the Contractor shall remove containment and dispose of it as ACM waste per Part 6, Exhibit E. If clearance sampling is unacceptable, repeat Section 3.2.C.

9. Wastewater associated with asbestos abatement shall be handled in accordance with Article 3.1.E of Section 01517.

D. Floor tile, mastic, woven cloth-covered electric wire, built-up roofing, and gaskets may become friable during removal; therefore, the Contractor shall remove such material in a manner that does not allow it to become friable while also adhering to all applicable government, state, and local asbestos abatement regulations.

E. All ACM material shall be dispositioned in accordance with the MSCC located in Part 6, Exhibit E.

3.3 QUALITY ASSURANCE

The Contractor and Fluor Fernald shall inspect removal methods and filled containers to ensure compliance with the requirements of this Section.

END OF SECTION

Title: Demolition Closure Project	Specification No: 01789-TS-0001		
	Date: 09/04/01	Section 01517	Rev 0

Approved: Joseph S. Stoner 9/4/01
Date

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SECTION 01517

REMOVING/FIXING RADIOLOGICAL CONTAMINATION

PART I GENERAL

1.1 SCOPE

A. The scope of this Section is decontamination of dismantled equipment or the structure to a level that permits removal of the debris from a local containment enclosure, or permits opening the building to the environment. This Section includes, but is not limited to:

1. Decontaminating low-level uranium and thorium contaminated equipment, materials, structural members, and/or buildings,
2. Decontaminating enriched uranium contaminated equipment and materials,
3. Decontaminating RCRA contaminated equipment and materials,
4. Controlling and moving effluent produced during the removal and/or fixing of contamination, and
5. Fixing contamination.

B. Project Conditions

1. Process material (i.e., green salt, yellow cake, black oxide) in excess of films and precipitates has been removed from process equipment to the maximum extent practical by Fluor Fernald prior to D&D activities. If process material in excess of films and precipitates is found during D&D activities, Fluor Fernald shall be notified prior to disturbing the condition.

2. See Section 01120 for requirements to establish an inspection area.

3. Removing/fixing radiological contamination on multiple layers of transite roof panels is addressed in this Section; handling of transite panels is addressed in Section 07415.

4. Hazardous Waste Management Units (HWMUs) shall be decontaminated pursuant to the specific conditions included in Part 6, Section 3.4.

C. Fluor Fernald will perform all effluent sampling, analysis, and transportation.

1.2 RELATED SECTIONS

A. Section 01120 - Debris/Waste Handling Criteria
B. Section 03315 - Concrete/Masonry Removal
C. Section 05126 - Structural Steel Dismantlement
D. Section 07415 - Transite Removal

E. Section 15065 - Equipment/System Dismantlement
F. Section 15067 - Ventilation and Containment

1.3 REFERENCE MATERIALS

See Part 7 for the following:

A. Index of Drawings
B. Photographs
C. Drawings
D. Safe Work Plan Requirements

1.4 REFERENCES, CODES, AND STANDARDS

A. United States Department of Energy (DOE):

1. DOE Order 5400.5 Radiation Protection of the Public and the Environment
2. DOE/EH-0256T Radiological Control Manual, April 1994
3. DOE/EM-0142P Decommissioning Handbook, Chapter. 9, Mar. 1994

B. 10CFR835 Occupation Radiation Protection

1.5 SUBMITTALS

A. Before start of decontamination work, the Contractor shall submit for approval a Safe Work Plan in accordance with Part 7, ACR-002, Contractor Safe Work Plan Format Requirements, describing the system design for removing and/or fixing contamination. This includes the methods and equipment for: removing contamination; fixing contamination; and controlling, and filtering effluent produced during removal and/or fixing activities.

B. Product Data: The Contractor shall submit manufacturer's technical information including the material to be used, its intended use, and its application instructions.

1.6 DELIVERY, STORAGE, AND HANDLING

The Contractor shall deliver materials in original, new and unopened containers bearing the manufacturer's name, label, and the following information:

A. Name or title of material
B. Manufacturer's stock number and date of manufacture
C. Manufacturer's Name
D. Application instructions
E. Material Safety Data Sheets

PART II PRODUCTS

2.1 CONTRACTOR'S EQUIPMENT

A. The Contractor shall supply all equipment required to remove and/or fix contamination.

B. The Contractor shall supply all equipment required to control, filter, and move effluent produced during removal and/or encapsulation of contaminants. 3873

1. The filter system shall consist of a 20 micron pre-filter and a 5 micron filter to remove entrained particulate prior to effluent discharge to tankage.

2. The Contractor shall construct all holding tank systems and secondary containment systems as specified in Articles 3.1.D and 3.1.E.

2.2 MATERIALS

A. Encapsulating coatings: If encapsulating coatings are employed, they shall be Carboline D3358 or approved equal. Manufacturers may include, but are not limited to: Tnemec Series 6 - Tnemec-Cryl, and products by Sherwin-Williams and International Protective Coatings.

B. If non-strippable coatings are employed, they shall include Polymeric Barrier System (Bartlett), or a Fluor Fernald-approved equal.

C. Plastic sheeting: Where encapsulation by clear plastic sheet wrapping is allowed, the wrapping shall be a minimum of 6-mil reinforced fire-retardant polyethylene sheeting.

PART III EXECUTION

3.1 APPLICATION

A. Requirements for managing non-process debris and process debris are described in Section 01120, Articles 3.2.A.1 and 3.2.A.2.

B. Requirements specific to debris decontamination and their removal from a building enclosure or local containment:

1. Prior to removing debris from a building enclosure or local containment, all internal and external surfaces shall be free of gross removable surface contamination, films and precipitates. Acceptable methods for removing surface contamination, films, and precipitates include but are not limited to: hydro-blasting with a minimum of 1,000 psi, steam-cleaning, sponge blasting, CO_2 blasting, or other methods approved by Fluor Fernald.

2. Debris and equipment/systems shall be managed in accordance with Section 01120, Article 3.2.

3. Thorium-contaminated items or debris cannot be released from the building enclosure or local containment areas unless they meet thorium-specific release limits (as referenced in Part 8, Section C 2.4.3). If items do not meet release limits, then they shall be either:

   a. decontaminated, wrapped and brought directly to containers labeled as containing thorium-contaminated items (not for re-packaging), or
   b. containerized prior to removal from the enclosure as determined by Fluor Fernald.

   In all cases where a thorium-contaminated area is separated from a uranium-contaminated area by a wall, the Contractor shall anticipate that the interstitial spaces in the wall will be thorium-contaminated.

4. Equipment/systems identified by Fluor Fernald as being contaminated with uranium with an enrichment over 2 percent will be removed, wrapped, and containerized by the Contractor for disposition as contaminated material without decontamination (such items shall be identified in the MSCC, Part 6, Exhibit E). These items shall not be allowed to get wet.

C. Requirements Specific to Decontamination of Structures and Outdoor Process Tanks/Pipes:

1. Structures:

Prior to opening contaminated structures to the environment (by removing the exterior siding or structural dismantlement), the Contractor shall remove and/or fix radiological contamination on all surfaces within the facility until the detected radioactivity levels are below release criteria identified in Part 8, Section C 2.4.3. Fluor Fernald will perform a radiological release survey to ensure the radioactivity criteria are met.

2. Transite Roof and Wall Panels:

Exterior panels shall be removed in a manner that minimizes the possibility of loose contamination becoming airborne (visible) when the panel is removed. A HEPA vacuum shall be used to remove any loose contamination which may be exposed when the exterior panel is removed (e.g., the under side of the outer panel and the upper surface of the lower roof panel). After the roof or wall panels have been vacuumed, all newly exposed surfaces shall be encapsulated to fix any contamination that remains. Vacuumed residues shall be handled as Debris Category J, in accordance with Part 6, Exhibit E (Debris Category J).

3. Outdoor Process Tanks and Pipe:

a. Prior to demolition of outdoor process (or suspect process) tanks, all surfaces (interior and exterior) shall be decontaminated to meet the radiological release criteria for outdoor process tanks contained in Part 7. If outdoor tanks do not meet the release criteria in Section 01519, they shall be demolished within a containment, either constructed or existing, in accordance with Section 15067 unless one of the following methods are implemented:

1. Encapsulate and mechanically cut (e.g., shear, saw, etc.):

Prior to tank demolition, the interior of the tank shall be empty and fully encapsulated. During tank demolition, the work area shall be misted with water to minimize release of airborne contamination.

2. Torch or other "hot cutting" methods:

The Contractor shall propose methods that minimize "hot cutting" (e.g., oxy/gas and oxy/acetylene torch cutting). If approved by Fluor Fernald, "hot cutting" of surfaces that exceed 25,000 dpm/100cm^2 beta-gamma total contamination or are thorium contaminated shall be performed within containment per Section 15067.

Hot cutting of tank surfaces may be considered by Fluor Fernald as a proposed method of dismantlement for tanks and pipe located outside of containment, provided that: 3873

a). HEPA filtered ventilation is maintained, and/or

b). point-of-cut ventilation can be provided such that fugitive emissions are captured and project boundary airborne radioactivity levels are maintained according to limits specified in Part 8, Section C 2.4.2.

The ventilation/containment requirements of Section 15067 apply.

3. Hot cutting may be performed on contaminated surfaces less than 25,000 dpm/100cm^2 beta-gamma total contamination with local HEPA ventilation. (Note: this clause applies only to uranium-contaminated outdoor process tanks and pipe.)

b. Internal surfaces of process piping are assumed to exceed both the removable and total contamination limits for uncontained demolition. However, removal and transport to the debris decontamination area of process piping that is located outside of the building structures may be performed outside of containment if the methods of cutting inherently minimize fugitive emissions.

4. Acceptable methods for removing surface contamination on structures and outdoor tanks/pipes include, but are not limited to: hydro-blasting with a minimum of 1,000 psi, steam-cleaning, sponge blasting, CO_2 blasting, or other Fluor Fernald-approved method.

5. Encapsulation of surfaces is required if the release criteria specified in Part 8, Section C 2.4.3 have not been met and decontamination has been attempted at least once. Fluor Fernald shall be notified prior to encapsulation to allow for inspection for visible process residues. Acceptable methods for encapsulating contamination, which is not readily removed by the above-identified methods include, but are not limited to, encapsulating coatings, non-strippable coatings as referenced in Article 2.2, and wrapping in reinforced sheeting and sealed prior to movement to prevent migration of potential contaminants. The Contractor shall take precautions to prevent the breaching of encapsulating coatings applied to equipment or structure. If an encapsulating coating is breached after application, during activities leading up to but not including structural demolition, the Contractor must take action to reseal the breached areas.

6. If stabilizer or non-strippable coatings are used as fixatives, they will meet the requirements of this specification (see Article 2.2).

7. Down posting of thorium contaminated areas requires that contamination levels meet the thorium-specific release limits of Section 01519.

8. If hydro-blasting or steam cleaning is employed, the Contractor shall:

a. Seal floor cracks/seams, openings, and building cracks using sealants to protect the environment from migration of contaminants.

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b. Contain effluents to the building interior/outdoor tank containment system and subsequently to collection systems.

9. The Contractor may utilize any existing building floor sumps for effluent collection, as long as system capacity for sludge and/or liquid does not exceed limitations determined from enriched levels as stated in Article 3.1.D.

10. The Contractor shall take precautions to prevent the spread of contamination from other more-contaminated areas of the facility to less contaminated areas.

11. Acceptable methods for decontamination of Hazardous Waste management Units (HWMUs) to meet RCRA/CERCLA closure Ohio Environmental Protection Agency guidance are hydro-blasting or steam cleaning with a minimum of 1,000 psi, unless otherwise stated in Part 6, Section 3.4 for that particular component.

D. Rinseate/Effluent Handling:

1. The Contractor shall collect all waste and effluent generated while removing and/or fixing contamination. Effluent and sludge shall be containerized in accordance with the requirements listed in Articles 3.1.D and 3.1.E.

2. For rinseate/effluent generated from decontamination of a structure containing uranium and/or thorium contamination, or from decontamination washwater generated from contact with outdoor pads with process tanks and pipes:

   a. The Contractor shall supply all effluent collection equipment (e.g., pumps, secondary containment, tanks).
   b. Effluent tanks require secondary containment with a minimum of 10 percent of the combined capacity of the effluent tanks housed and not less than the volume of one full tank, whichever is greater.

3. Enriched Equipment/Material (if listed in Part 6, Section 3.0): In addition to effluent tanks, the washing of enriched equipment/material requires the use of smaller tanks to permit safe quantities to be maintained (for nuclear criticality safety purposes). There are no mass restrictions for rinseates or sludges with a U-235 enrichment less than 1 percent.

   a. For enrichments greater than 1 percent and less than or equal to 1.25 percent, the Contractor shall supply effluent storage tanks of no greater than 175 gallon capacity, in numbers sufficient to permit 15 calendar days storage without impact to Contractor operations.

   b. For enrichments greater than 1.25 percent and less than or equal to 2 percent (no equipment/material over 2 percent enrichment is to be decontaminated, see Article 3.1.B.3), the Contractor shall supply effluent storage tanks no greater than 30 gallon capacity, in numbers sufficient to permit 15 calendar days storage without impact to Contractor operations.

   c. The Contractor shall store sludge, resulting from enriched equipment/material cleaning, in 55-gallon drums. Filled drums may be stored no closer than 2 feet apart.

d. Should equipment be discovered with uranium enrichment greater than 1 percent then equipment/material washing operations and effluents shall be maintained separate, based on enrichment and type, by the following: 1) uranium less than or equal to 1 percent enrichment; 2) uranium greater to 1 percent enrichment but less than or equal to 1.25 percent enrichment; 3) uranium greater than 1.25 percent enrichment but less than or equal to 2 percent enrichment; and 4) thorium. Wash systems can be maintained separate by campaign or by physically separate systems.

4. The Contractor shall devise a system that uniquely identifies each tank of generated wastewater. Prior to filling, a unique number shall be determined for the tank contents and this number shall be identified in the field, on the sampling plan, and on the wastewater discharge request.

5. Approval to commingle the effluents and sludges is required from Fluor Fernald. Approval to transfer effluents to large effluent tanks is required from Fluor Fernald.

6. The Contractor shall notify Fluor Fernald when the effluent tanks are filled. Fluor Fernald will sample, empty the tanks, and transport the effluent to the FEMP Advanced Wastewater Treatment Facility. Upon testing and approval of laboratory analysis from Fluor Fernald, Fluor Fernald shall empty the contents of the effluent storage tanks and transport the effluent to the FEMP AWWT. The Contractor shall keep additional tanks in reserve, as the tank(s) will be out of commission until the sample results are received and water is dispositioned. The Contractor shall allow six weeks for this process.

7. Effluent generated from the decontamination and/or rinsing of HWMUs shall be collected and temporarily stored separately from general, non-HWMU effluent. Fluor Fernald will notify the Contractor when commingling of HWMU and non-HWMU effluent may occur.

8. The Contractor shall supply storage tanks and secondary containment with a minimum liquid effluent storage capacity to allow 20 days storage without impacting the Contractor operations.

9. The Advanced Wastewater Treatment Facility (AWWT) of the Fernald Environmental Management Project (FEMP) is not designed to process heavy oils, greases, or other stratified organic layers. Should such contaminates exist, Fluor Fernald shall be responsible for their removal from the wastewater prior to delivery to the AWWT. The contaminants shall be containerized and delivered to Fluor Fernald personnel, who will be responsible for disposal.

E. Sludge Drumming

Sludge limits for individual drums from enriched cleaning operations are restricted to 104 grams of U-235 per 55-gallon drum. (Note: The weight is limited due to Department of Transportation and/or the maximum allowable weight of the drum.)

END OF SECTION

Title: Demolition Closure Project	Specification No: 01789-TS-0001		
	Date: 09/04/01	Section 01519	Rev 0

Approved: Joseph S. Stoner 9/4/01 Date

SECTION 01519

DECONTAMINATION OF CONTRACTOR PROVIDED TOOLS, EQUIPMENT AND MATERIAL

PART I GENERAL

1.1 SCOPE

A. Preventative measures for and decontamination of Contractor provided tools, equipment (including vehicles), and material to a level that permits removal from an enclosure/work zone, restricted reuse, or unrestricted release. This Section includes, but is not limited to:

1. Preventative measures/waste minimization,
2. Decontamination area requirements,
3. Methods of decontamination activities,
4. Control of effluent and waste management activities, and
5. Relocation, reuse, and release activities for tools, equipment, and material.

B. Project Conditions and Requirements:

1. All facilities, unless expressly noted in Part 6 Section 3.0, shall be considered contaminated with radioactive material.

2. All items are considered potentially contaminated if they have been used or stored in Controlled Areas that could contain unconfined radioactive material.

3. The Contractor shall establish a holding/inspection area to allow Fluor Fernald to perform tool and equipment radiological surveying.

   a. The holding/inspection area shall be arranged such that routine access is prevented by means of fencing and/or barrier tape with appropriate posting to identify that the items contained are being held for survey, and such that the area is off limits to individuals other than Fluor Fernald/Contractor radiological survey personnel.
   b. Only those items which meet the requirements (as described in this Section) for leaving the work zone should enter the inspection area.

4. The Contractor should assume that extensive dismantlement and an aggressive decontamination effort will be required to achieve unrestricted release of items that have come in contact with radioactive material or were used in contamination areas. Based on past experience using the best available technologies, decontamination and survey access requirements to meet the release criteria may be difficult to achieve.

5. Hand and portable tools used in controlled areas for performance of the subcontract are to be considered expendable as specified in Part 4 - Special Terms and Conditions, DISPOSITION OF CONTRACTOR PROVIDED EQUIPMENT, TOOLS, AND MATERIALS THAT HAVE BECOME CONTAMINATED (SC-27).

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1.2 RELATED SECTIONS

Work related to this Section shall also be accomplished in accordance with the following Sections:

A. Section 01120 - Debris/Waste Handling Criteria,
B. Section 01517 - Removing/Fixing Radiological Contamination, and
C. Section 15067 - Ventilation and Containment.

1.3 REFERENCE MATERIALS

A. Part 4 – "Special Terms and Conditions, DISPOSITION OF CONTAMINATED TOOLS, EQUIPMENT, AND MATERIALS" (SC-11).
B. Part 6 - Section 1.0, "Scope of Work"
C. Part 7 - ACR-002, "Safe Work Plan Requirements"

1.4 REFERENCES, CODES, AND STANDARDS

A. United States Department of Energy (DOE):

1. DOE Order 5400.5, Radiation Protection of the Public and the Environment
2. DOE/EH-0256T, Radiological Control Manual, April 1994
3. DOE/EM-0142P, Decommissioning Handbook, Chapter. 9, Mar. 1994

B. 10CFR835 - Occupation Radiation Protection

1.5 SUBMITTALS

A. The Contractor must provide Fluor Fernald with a list of all tools, vehicles, equipment and material to be brought onsite which have been used in conjunction with radioactivity in the past including such information as:

1. Previous use of the equipment,
2. Dates of use,
3. Levels of contamination, and
4. Radioisotopes involved.

This list must be submitted as soon as known in advance of bringing the item onsite. Fluor Fernald reserves the right to reject the Contractor's request to bring these items on site. Any tools or equipment contaminated with a radioactive material greater than 1 percent enriched uranium or thorium-232 will be rejected. Thorium contaminated tools and equipment may only be used in a thorium contaminated area.

B. The Contractor shall submit the manufacturer's technical information for any decontamination or contamination controlling agents for compliance review prior to use. This information shall include:

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1. Material to be used,
2. Intended use,
3. Application instructions, and
4. MSDS Sheets.

C. Before start of decontamination work, the Contractor shall submit a Safe Work Plan addressing tool and equipment decontamination for compliance review in accordance with Part 7 - ACR-002 ("Contractor Safe Work Plan Format Requirements"), describing the following:

1. Preventative measures to be employed,
2. The design and construction of the decontamination area,
3. The methods to be utilized for decontamination (see Article 3.1.C of this Section),
4. The methods and equipment for controlling and handling effluent and/or secondary waste produced during decontamination activities, and
5. Plans for relocating, reusing, or releasing tools and equipment.

PART II PRODUCTS

2.1 CONTRACTOR PROVIDED TOOLS AND EQUIPMENT

A. The Contractor shall furnish all equipment, tools, and material required to perform the work described in the subcontract except where the contract explicitly states that Fluor Fernald will provide the item.

1. The Contractor shall deliver approved decontamination and contamination control materials in original, new and unopened containers bearing the manufacturer's label, and the following information:

   a. Name or title of material,
   b. Manufacturer's stock number and date of manufacture,
   c. Manufacturer's Name, and
   d. MSDS Sheets.

2. All possible shipping and packing materials will be removed upon receipt at the site prior to entering the controlled area to minimize contaminated waste generation.

B. ALARA

1. For the purposes of meeting the "As Low As Reasonably Achievable" (ALARA) goal for tools, equipment, and materials, it is expected that:

   a. All reasonable efforts are to be used to control residual contamination to the extent that there is no detectable contamination on items that were free of contamination prior to use.
   b. There is no increase in the level of contamination on items that were previously contaminated.

2. The ALARA efforts include, but are not limited to, the following:

   a. Protective measures prior to use of items,

b. Preventative measures while items are being used, and
c. Decontamination upon completion of work activities.

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3. In support of the ALARA initiative, all Contractor furnished tools, vehicles, equipment, and material may be inspected for radioactive contamination by Fluor Fernald personnel prior to initial entry and upon removal from the radiological controlled area.

PART III EXECUTION

3.1 APPLICATION

A. Prevention of or Minimizing Contamination:

1. The Contractor shall plan and coordinate all work to minimize exposure of equipment, tools, and vehicles to potential radioactive contamination. Equipment shall be located in the area with the least potential for contamination. For example, locate equipment outside the facility with leads, hose lines, etc. wrapped and run to the interior of the facility. Typical examples of equipment where this approach should be used include air compressors, high pressure hydroblasters, welders, generators, oxy-acetylene cylinders, and battery chargers.

2. It is the Contractor's responsibility to evaluate materials, tools and equipment for ease of decontamination and disassembly that may be required for decontamination prior to use on-site. Use of unrestricted release items (i.e., those other than expendable as defined in Part 4, Special Terms And Conditions, SC-27 - "DISPOSITION OF CONTRACTOR PROVIDED EQUIPMENT, TOOLS, AND MATERIALS THAT HAVE BECOME CONTAMINATED") should incorporate appropriate precautions to prevent contamination. These precautions should be implemented prior to and during use. Precautionary measures may include the following, which are expected to be implemented as described in the Safe Work Plan:

   a. Internal combustion equipment subject to contamination should make use of pre-filters or have a separate source of outside air on the intake.
   b. High volume air handling equipment such as blowers, compressors, etc., shall have a filtered inlet to minimize the potential for internal contamination due to build up of low level radioactivity.
   c. The Contractor is prohibited from bringing electrical driven mobile equipment to the FEMP (e.g., fork-lifts) except where only electric driven equipment is available.
   d. Protective sheathing/covers, strippable coatings, or protective caps should be used to minimize the potential for contamination (e.g., coating the buckets of man lifts or other walking/standing surfaces). In addition, all openings on equipment, tools, or vehicles that may permit contamination of inaccessible or difficult to clean areas shall be covered and protected.

3. If encapsulants, sealants and/or coatings are utilized during the project, the Contractor shall be responsible for protecting their tools and equipment from over spray. In addition, the Contractor shall ensure that the encapsulant, sealant and/or coating can be readily removed during decontamination activities, if necessary.

B. Decontamination Area Requirements:

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1. Tools and equipment utilized inside an enclosure/building may be decontaminated at an existing indoor debris cleaning location.

2. The following are examples of options for establishing outdoor decontamination areas:

   a. Utilize an existing concrete pad with run-on and run-off controls.
   b. Construct a temporary containment area. Containment must have a bermed perimeter to ensure run-off control. An example of acceptable containment is Herculite with sandbag underlayment perimeters on grade without penetrations. Containment used must be adequate to maintain its integrity.

C. Methods of Decontamination Activities:

1. Where decontamination is needed, the Contractor shall at a minimum use the following as applicable:

   a. Dry cleaning.
   b. Steam cleaning.
   c. High pressure, hot water hydroblasting (may be used in conjunction with abrasive techniques and approved decontamination agents) with a minimum of 1,000 psi and HEPA vacuuming.

2. When selecting a decontamination technique other than those identified in C.1 above, consideration should be given to those technologies that minimize radiological airborne emissions, secondary wastes, and tool or equipment damage.

3. As an alternative to decontamination, replacement of contaminated components shall be in accordance with the requirements of Part 4, Special Terms And Conditions, SC-27 - "DISPOSITION OF CONTRACTOR PROVIDED EQUIPMENT, TOOLS, AND MATERIAL THAT HAVE BECOME CONTAMINATED".

   a. The contaminated components are subject to the cleaning criteria stated in Article 3.2.B.
   b. The contaminated components will be managed and handled per Section 01120 and Part 6, Exhibit E subsequent to the cleaning as directed by Fluor Fernald.

D. Control of Effluent and Waste Management Activities:

1. The Contractor shall control and collect all waste and effluent generated while removing and/or fixing contamination in accordance with the requirements listed in Sections 01120 and 01517.

2. Management of wastes generated during decontamination activities shall be in accordance with Section 01120 and the Waste Management Plan located in Part 6, Exhibit E.

E. Relocation, Reuse, and Release of Tools, Equipment, and Material:

1. The Contractor shall perform all decontamination and surveying activities required to verify that the surface contamination limits identified in Table 1 of this Section are not exceeded. Fluor Fernald shall perform final verification surveying.

TABLE 1 SURFACE CONTAMINATION LIMITS(a)

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NUCLIDE(f)	FIXED PLUS REMOVABLE		REMOVABLE(b),(e)
	AVERAGE(b),(c)	MAXIMUM(b),(d)	
U-nat, U-235, U-238, and associated decay products, alpha emitters.	5,000 dpm /100 cm^2	15,000 dpm /100 cm^2	1,000 dpm/100 cm^2
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm^2	300 dpm/100 cm^2	20 dpm/100 cm^2
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000 dpm/100 cm^2	3,000 dpm/100 cm^2	200 dpm/100 cm^2
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5,000 dpm /100 cm^2	15,000 dpm /100 cm^2	1,000 dpm /100 cm^2

(a) Where surface contamination by both alpha and beta-gamma emitting nuclides exists, the limits established for alpha and beta-gamma emitting nuclides should apply independently.

(b) As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

(c) Measurements of average contaminant should not be averaged over more than one square meter. For objects of less surface area, the average should be derived for each object.

(d) The maximum contamination level applies to an area of not more than 100 cm^2.

(e) The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

(f) The limits presented for transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, and Ac-227 may be adjusted on a case by case basis. Consult with Radiological Compliance when required to apply these limits for unrestricted release.

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2. The Contractor shall provide notice to Fluor Fernald of intent to remove tools and equipment from the contamination area, in accordance with Part 6.

3. Release of tools, equipment, and material from Contamination Areas to the Controlled Area:

   a. If removable contamination in excess of the limits of Table 1 is present on the tools, equipment or material, then:

      1). The items must remain in the contamination area for decontamination, or
      2). The item must be contained such that no contaminated surfaces of the item are accessible without disassembling the equipment or breaching the containment.

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b. Examples of acceptable containment include plastic wrapping, yellow Herculite wrapping, or a sealable hard container. However, the containment used must be adequate to maintain its integrity considering the weather, conditions of storage, and the methods or conditions of transport.

c. If the removable contamination limits are met but the total (fixed plus removable) limit is exceeded, the item may be labeled or identified as radioactive material by Fluor Fernald and released to the Controlled Area.

4. Unrestricted Release Criteria:

Tools and equipment with detectable radioactivity may be released from the controlled area with the approval of a Fluor Fernald Radiological Control Technician if all of the following have been met:

a. Both removable and total surface contamination (including contamination on and under any coating) are in compliance with the levels given in Table 1 and that the item has been subjected to the ALARA process described in Article 2.1.B.

b. All areas must be readily accessible for survey for residual radioactivity including proper surface counting geometry to allow for accurate quantification. Items with inaccessible areas which are likely to be contaminated but are of such size, construction, or location as to make them inaccessible for survey shall be assumed to exceed the limits for release. The item must either be disassembled to permit an adequate survey to certify that internal contamination is at or below the limits of Table 1, or well documented process knowledge can be applied to provide confidence that contamination in inaccessible areas is not probable. In evaluating the potential for contamination in inaccessible areas, consideration will be given to where the item was used on site and preventative measures taken prior to use, such as coverings, wrappings, air intake filters, etc.

c. Upon approval from Fluor Fernald, the Contractor shall remove the tools, equipment, and/or materials off -site within eight hours.

5. Release to an Off -Site Licensed Facility:

a. If the Contractor possesses the appropriate license to receive, possess, use, and transfer the equipment, tools, material, or vehicles with radioactive contamination, Contractor may elect to remove such items from the site in lieu of decontamination. The responsibility of complying with all state, local and federal regulations during the packaging, shipping, and receipt of the equipment shall be the responsibility of the Contractor. The Contractor shall submit a copy of the license and applicable procedures to Fluor Fernald for compliance review prior to removal of the contaminated equipment. A copy of all Bills of Lading shall be submitted to Fluor Fernald prior to shipment.

b. The Contractor is to provide 24 hours notice to Fluor Fernald prior to shipping radioactive tools, equipment, and/or material.

3.2 UNSUCCESSFUL/IMPRACTICAL CONTRACTOR DECONTAMINATION

A. If Fluor Fernald determines that the Contractor has implemented the requirements of this Section and the Safe Work Plan and the Contractor's decontamination efforts are unsuccessful or decontamination is not practical (as identified below), refer to Part 4 - Special Terms And Conditions, DISPOSITION OF CONTRACTOR PROVIDED EQUIPMENT AND TOOLS THAT HAVE BECOME CONTAMINATED (SC-27) for action to be taken.

B. Decontamination may be considered impractical for non-expendable items that are integral parts of equipment and not readily replaceable such as porous materials (e.g., wood and fiberglass), wire rope, chains, brushes, items with finned surfaces, and similar items where contamination may be embedded within the material configuration matrix. These items may not be released if detectable contamination is identified on the surface.

C. All tools, material, vehicles, and equipment accepted by Fluor Fernald for disposition must have been cleaned to meet the visual inspection requirements defined in Section 01517 and handled as defined in Section 01120 and the Waste Management Plan located in Part 6, Exhibit E.

3.3 QUALITY ASSURANCE

All QA requirements required to be met by the Subcontractor are stated in Part 9.

END OF SECTION

Approved: _____ 9/4/
Joseph S. Stoner Date

SECTION 03315

CONCRETE/MASONRY REMOVAL

PART I GENERAL

1.1 SCOPE

Dismantling of all above-grade concrete and masonry, including:

A. Elevated floor and roof slabs,
B. Cast-in-place walls,
C. Pre-cast concrete components,
D. Foundations, piers, and selected curbs,
E. Concrete encasement (e.g., fireproofing),
F. Interior and exterior masonry,
G. Control of fugitive emissions, and
H. Windows, doors, roof louvers and lead.

1.2 RELATED SECTIONS

A. Section 01120 - Debris/Waste Handling Criteria
B. Section 01515 – Mobilization, Demobilization, and General Site Requirements
C. Section 01517 – Removing/Fixing Radiological Contamination
D. Section 05126 – Structural Steel Dismantlement
E. Section 15067 – Ventilation and Containment
F. Section 03920 – Concrete Surface Removal

1.3 REFERENCE MATERIALS

See Part 7 for the following:

A. Index of Drawings,
B. Photographs,
C. Drawings, and
D. Contractor Safe Work Plan Format Requirements.

1.4 REFERENCES, CODES, AND STANDARDS

All work shall be accomplished in accordance with the following reference, code, and standard requirements:

A. American National Standards Institute (ANSI):

1. ANSI A10.6-90 Safety Requirements for Demolition Operations
2. ANSI A10.8-88 Construction and Demolition Operations – Scaffolding – Safety Requirements
3. ANSI A10.9-83 Construction and Demolition Operations – Concrete and Masonry Work – Safety Requirements

B. National Fire Protection Association (NFPA):

1. NFPA 101A-98 Code for Safety to Life from Fire in Buildings and Structures
2. NFPA 241-93 Standard for Safeguarding Construction, Alteration, and Demolition Operations

C. DOE N441-1 Radiation Protection of the Public and the Environment

D. 10 CRF 835 Occupational Radiation Protection

E. Ohio Administrative Code (OAC): 3745-17-08 Restriction of Emission of Fugitive Dust

1.5 SUBMITTALS

The Contractor shall submit for approval a Concrete/Masonry Removal Safe Work Plan in accordance with Part 7 - ACR-002, Contractor Safe Work Plan Format Requirements, which contains the following information:

A. Detailed method and sequence of dismantlement, including equipment to be used.

B. Methods for control of contaminants, including control of fugitive emissions.

C. Materials, such as non-woven geotextile fabrics and surfactants, to be used.

D. Methods of cutting, including equipment to be used.

E. Calculations. Verification of the structural adequacy of partially dismantled structures, as applicable, shall be stamped by a Professional Engineer registered in the State of Ohio.

F. If dismantlement method requires personnel on the roof, the Contractor shall provide calculations verifying the structural adequacy of the roof to support personnel and equipment. A Professional Engineer registered in the State of Ohio shall stamp these calculations.

G. If controlled explosive methods are proposed to be used on building structures that are constructed of precast columns and roof beams, a detailed Safe Work Plan containing the following information shall be prepared:

1. Methods and materials to be used.
2. Means to protect adjacent structures, equipment, material, and underground utilities from damage, including protection from projectiles.
3. Methods and materials to control fugitive emissions.
4. Contingency plan for detonation failure.

5. Proof of permit, issued by the Bureau of Alcohol, Tobacco and Firearms, to use explosives.
6. Methods and materials to store explosives according to the requirements of 29 CRF 55 Subpart K.
7. Evidence of previous work experience using controlled explosives to take down multi-story structures near other structures within the last 5 years. Provide project locations and contacts for verification.

H. Detailed method and sequence of dismantlement of Technetium-99 contaminated concrete, including equipment to be used, method of removal, equipment/method to control, filter and store waste produced during Tech-99 Concrete removal.

PART II PRODUCTS

2.1 MATERIALS

A. Non-woven Geotextile Fabric:

1. Trevira Spunbond 1120 by Hoechst Celanese Corp.
2. Mirafi 160N by Mirafi, Inc.
3. ADS 600 by Advanced Drainage Systems, Inc.
4. Equal products manufactured by others will be acceptable. Must be approved by Fluor Fernald.

B. Encapsulants/Lockdowns:

1. Control – Grayling Ind.
2. Foster 32-60 – Foster Products Corp.
3. Fiberset PM – Fiberlock Technologies
4. ACC 22-P – American Coatings Corp.
5. Serpiloc
6. Approved equal

C. Bridging Encapsulants:

1. Asbestos Binding Compound – Fiberlock Technologies
2. Leadlock – Global Encasement Systems
3. Foster 32-80, Foster Products Corp.
4. Approved equal

PART III EXECUTIONS

3.1 PREPARATION

A. The Contractor shall ensure that adequate lay down space has been cleared and barriers have been established.

B. The Contractor shall take the following precautions to control fugitive emissions. A wet dust suppression system shall be used. This system will utilize the following:

1. Amended water (with surfactant), and

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2. Finely atomized water spray.

C. Concrete and masonry shall have contamination fixed or removed prior to dismantlement and prior to removing local containment or building enclosures, in accordance with Section 01517.

3.2 APPLICATION

A. The Contractor shall prevent damage to adjacent structures, materials, and equipment including underground utilities, during dismantlement activities. Activities to fell concrete structures outside their own footprint require prior approval. Activities to fell concrete structures shall maintain the integrity of porous surfaces to the extent practical to minimize dispersal of debris. If concrete dust is generated as a result of removal operations (due to crumbling, etc.), dust suppression techniques must be employed during demolition and, if necessary, during transportation.

B. Removal of Above-Grade Concrete/Masonry:

Any above-grade concrete/masonry remaining intact following structural dismantlement shall be removed down to grade-level except for poured concrete structures that are imbedded in soil (e.g., raised slabs, curbs on slabs, foundations, concrete tank saddles), which shall remain in place.

C. Removal of At-Grade Concrete/Masonry:

1. Concrete slabs, pedestals, columns, miscellaneous foundation piers, walls, and curbs shall be sealed and may remain intact during and after structural dismantlement.

2. Cut all reinforcing (e.g., rebar) and anchors flush with base slab for areas designed on the Civil Demolition Plan for potential debris stockpiling. For all other areas, reinforcements and anchors need only be cut down to within one inch of the base slab.

D. Cutting:

1. All material shall be reduced in size as required for containerization in accordance with Section 01120 and the Waste Management Plan (WMP) located in Part 6, Exhibit E.

2. Embedded steel reinforcing is considered part of concrete. Reinforcing bar/mesh shall be cut to less than 1 ft. from concrete mass.

3. Because of contamination levels, some concrete may require local containment for cutting activities in accordance with Section 15067. Any currently known areas requiring local containment are identified in Part 6, Section 3.0; however, new or additional areas may be identified during dismantlement activities.

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E. Explosives:

1. Interior non-load bearing masonry walls shall be removed using non-explosive methods prior to opening the shell of the structure. For interior poured concrete walls, the Contractor shall have the option to leave them in place during structural dismantlement provided that facility release criteria are met prior to structural dismantlement and the method of dismantlement in the Concrete/Masonry Removal Safe Work Plan is approved by Fluor Fernald personnel.

2. Any bituminous roofs felled by explosives are to be dropped in a single unit and impact the ground in a horizontal plane.

3.3 SPECIAL INSTRUCTIONS

The following special instructions apply to concrete/masonry removal:

A. Windows and Doors

1. The Contractor shall remove all windows in one piece and place them in appropriate containers.

2. The Contractor shall remove all doors (wood and/or steel) and place them in appropriate containers.

B. Lead Materials

1. The Contractor shall segregate all lead materials (e.g., flashing, vent stacks, etc.) and place them in appropriate containers in accordance with Section 01120 and the WMP located in Part 6.

2. Prior to torch cutting on a surface coated with a lead-based paint, an eight-inch strip of paint shall be removed at the area of the cut (e.g., 4 inches on each side of cut).

3. The Contractor shall (whenever possible) dismantle lead flashing in a manner that will facilitate recycling. This will include minimizing inaccessible surfaces and maximizing straight lengths. This will also include avoiding the use of fixatives on the lead flashing that would require an abrasive method of removal.

C. Wall and Roof Louvers

The Contractor shall remove louvers and roof vents during exterior concrete/masonry removal and place in appropriate containers.

END OF SECTION

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Approved: _____ 9/4/01
Joseph S. Stoner Date

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SECTION 03920

CONCRETE SURFACE REMOVAL

PART I GENERAL

1.1 SCOPE

This Section defines the work related to the removal of a surface layer from the existing concrete pads utilizing surface removal technologies. Principals included in this Section are:

A. Removing surface layer,
B. Controlling and transporting waste produced during the removal of concrete,
C. Controlling the spread of radiological contamination in the operating area, and
D. Equipment types and usage.

1.2 RELATED SECTIONS

A. Section 01120 - Debris/Waste Handling Criteria
B. Section 01517 - Removing/Fixing Radiological Contamination
C. Section 15067 - Ventilation and Containment
D. Section 01519 - Decontamination of Contractor Provided Tools, Equipment, and Materials

1.3 REFERENCE MATERIALS

A. See Part 7 for the following:

1. Index of Drawings,
2. Photographs, and
3. Existing Drawings.

B. See Part 8 – Section C 2.0 for the Radiological Requirements.

1.4 REFERENCES, CODES, AND STANDARDS

See General Per Section 01010.

1.5 SUBMITTALS

A. Before start of concrete surface removal work, the Contractor shall submit for approval a work plan describing the system design for removing concrete. The work plan shall describe methods and equipment for removing concrete, including equipment used for controlling, filtering, and

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transporting waste generated during removal activities. The work plan shall also describe meth and equipment used to control the generation and spread of contamination.

B. Product Data: The Contractor shall submit manufacturer's technical information on all materia be used, including their intended use and application instructions.

C. See Part 6, Section 11.0 for additional submittal requirements.

1.6 QUALITY ASSURANCE

Prior to commencement of work, the Contractor shall demonstrate the methods for removing concrete sample area of a concrete floor selected by Fluor Fernald.

1.7 PROJECT CONDITIONS

A. Radiological contamination has been detected on concrete pads, as identified in Part 6, Section 3 The Contractor is to remove surface layers of concrete in the locations and to the depth speci This may require concrete removal adjacent to curbs and foundations.

PART II PRODUCTS

2.1 MANUFACTURERS/EQUIPMENT

A. The Contractor shall supply a system with all equipment required to remove concrete, inclu equipment to control, filter, and transport waste produced during concrete removal.

B. The concrete removal system (equipment) shall include, but not be limited to, the following feat

1. Integral vacuum system with pre- and HEPA filters.
2. Controlled, dustless process with personnel exposure below DAC limits as defined in Pa
3. Simultaneous collection of waste in 55-gallon drums.
4. No use of water where technetium-99 contamination is of concern.
5. Equipment shall be portable.
6. Consideration shall be used to select equipment that can be easily decontaminated for release after use. For details on releasing tools and equipment, refer to Section 01519
7. Equipment shall implement waste management technology that minimizes secondary w
8. Vacuum design shall allow operator to fill, seal, remove, and replace the waste drum u negative pressure vacuum conditions/enclosures.

C. Fluor Fernald will provide standard 55-gallon drums for collection of waste. The Contractor provide all replacement filters.

D. Vendor shall provide method(s) for concrete removal adjacent to areas such as curbs and arc foundations.

E. Erection of any necessary local containment shall be defined by the vendor in accordance wit requirements of Section 15067.

PART III EXECUTION

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3.1 APPLICATION

A. All concrete removal activities shall be performed in accordance with 10 CFR 835.

B. All work is to be performed according to Fluor Fernald's health and safety requirements. Personnel in the controlled area shall be required to wear personal protective equipment as detailed in the health and safety matrix.

C. The Contractor shall control dust and debris generated while removing concrete. Fluor Fernaldshall monitor the area for airborne contamination. Contractor shall be required to make changes to operating methods and equipment if unacceptable levels of airborne contamination are found in the operating area.

D. The Contractor shall collect all waste generated while removing concrete. Waste and effluent shall be packaged in accordance with the requirements in the Waste Management Plan, located in Part 6, Exhibit E.

E. Once the concrete has been removed, the Contractor shall take precautions to prevent the further spread of radiological contamination to the area.

F. The Contractor shall not remove more than one-half (½) inch than is required.

3.2 QUALITY ASSURANCE

The Contractor and Fluor Fernald shall verify that the removal depths indicated in Part 6, Section 3.0 are met. The removal depths are the minimum requirements for concrete removal. Acceptable performance is achieved when the minimum removal has occurred over the work area specified.

END OF SECTION

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SECTION 05125

NEW STRUCTURAL STEEL/METALS

PART I GENERAL

1.1 SCOPE

Design, fabrication, and installation of miscellaneous metal items for protective barriers, lifting assemblies, rigging, and temporary bracing and supports.

1.2 RELATED SECTIONS

A. Section 01120 - Debris/Waste Handling Criteria
B. Section 05126 - Structural Steel Dismantlement

1.3 REFERENCE MATERIALS

See Part 7 for the following:

A. Index of Drawings,
B. Photographs, and
C. Drawings.

1.4 REFERENCES, CODES, AND STANDARDS

A. American Society for Testing and Materials (ASTM):

1.	ASTM A36-94	Standard Specification for Carbon Structural Steel
2.	ASTM A307-94	Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
3.	ASTM A325-94	Standard Specification for Bolts, Structural Steel, Heat Treated, 120/105 KSL Minimum Tensile Strength

B. American Welding Society (AWS):

1.	ANSI/AWS A2.4-93	Standard Symbols for Welding, Brazing, and Nondestructive Examination
2.	ANSI/AWS D1.1-96	Structural Welding Code, Steel
3.	ANSI/AWS D1.2-90	Structural Welding Code, Aluminum
4.	ANSI/AWS D1.3-89	Structural Welding Code, Sheet Steel

C. American Institute of Steel Construction (AISC):

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1. AISC Manual of Steel Construction - Allowable Stress Design (ASD), 9th Edition
2. AISC Manual of Steel Construction - Load and Resistance Factor Design (LRFD), 2nd Edition

D. American National Standards Institute (ANSI):

ANSI A10.13-89 Construction and Demolition Operations - Steel Erection - Safety Requirements

1.5 SUBMITTALS

A. The Contractor shall submit the following for conformance review by Fluor Fernald:

1. Calculations: Indicate design method, assumptions, loads, member forces, allowable stresses, and connection designs.

2. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

3. Indicate welded connections using standard ANSI/AWS A2.4 welding symbols. Indicate net weld lengths. Submit copies of welder's certifications with shop drawings.

4. A plan for conducting and documenting field quality testing and inspection including test methods and reports required under Field Quality Assurance.

5. Provide Material Safety Data Sheets for primer and finish coatings to be applied to new structural steel, and for welding materials.

6. Contractor's AWS Welding Program for approval.

7. Mill Test Reports for structural steel

B. For additional submittal requirements see Part 6, Section 11.0.

1.6 DELIVERY, STORAGE, AND HANDLING

ASTM A325 high strength bolts shall be delivered to the site in the original labeled containers and once onsite shall not be transferred into unlabeled containers. The label information shall include the type of bolt, purchase order number, and the name of the supplier.

PART II PRODUCTS

2.1 MATERIALS

A. Steel sections and plates: ASTM A36

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B. Structural Fasteners: Bolts shall be hardened and meet ASTM A325; nuts shall be heavy hex type meeting ASTM A563, Grade C; and washers shall be hardened and meet ASTM F436, Grade 1.

C. Miscellaneous Fasteners: Shall meet ASTM A307.

D. Expansion Anchors: Expansion bolts used for securing steel to concrete shall be one of the following:

1. "Parabolt" as manufactured by Molly Fastener Group of Emhard, Temple, PA 19560,
2. "Wedge Anchors" as manufactured by ITT Phillips Drill Division, Michigan City, IN 46360,
3. "Kwik Bolt" as manufactured by Hilti, Inc., Stamford, CT 06405, or
4. Fluor Fernald-approved equal.

E. Welding Materials: ANSI/AWS D1.1 - Structural Welding Code. Use E70XX electrodes.

F. Abide by requirements of Federal Fastener Act.

G. Shop Primer: Short-oil alkyd that is VOC compliant.

2.2 FABRICATION

A. For delivery to site, fit and ship assembled in largest practical sections.

B. Supply components required for connecting and anchorage of fabricated structural assemblies.

C. All welding procedures, welder's certification, and visual acceptance criteria must be in accordance with ANSI/AWS D1.1, Chapter 5.

D. Clean surfaces of rust, scale, grease, and foreign matter prior to applying shop primer. Prepare surface in accordance with paint manufacturer=s instructions.

E. Shop prime with one coat of short-oil alkyd primer per manufacturer=s instruction for primer (dry film) coat thickness.

F. Do not prime surfaces in direct contact with concrete or within three inches of where field welding is required.

G. All coatings shall be free of lead and chromium.

PART III EXECUTION

3.1 PREPARATION

Prior to fabrication, the Contractor shall verify field dimensions.

3.2 INSTALLATION - GENERAL

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Allow for installation loads and provide temporary bracing to maintain true alignment until

completion of installation.

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C. Field weld components as indicated on the approved drawings. Field welding shall be in accordance with ANSI/AWS D1.1, Chapter 3.

D. Fasteners shall be tightened to manufacturer's specifications or applicable design requirements

E. Field modifications to load bearing structures shall require prior approval from Fluor Fernald.

F. After installation, prime field welds and abrasions. Any steel embedded in concrete is an exception.

G. All steel shall be fabricated and installed in accordance with the AISC Manual of Steel Construction.

H. After use, all steel shall be dismantled and cut for containerization in accordance with Section 01120 and Section 05126.

3.3 QUALITY ASSURANCE

A. Calculations and shop drawings must bear the stamp of a Professional Engineer registered in the State of Ohio.

B. The Contractor shall inspect high-strength bolted connections for all shop-fabricated steel, and perform tests and prepare test reports in accordance with the AISC specifications. All test results shall be submitted to Fluor Fernald.

C. The Contractor shall conduct tests and shall state in each test report whether test specimens comply with requirements, and shall specifically state any deviations. Fluor Fernald must approve deviations in writing.

D. Shop and Field Welding

1. The Contractor shall: inspect and test, during fabrication and installation of structural steel assemblies in accordance with ANSI/AWS Structural Welding Code and as follows:

   a. Conduct inspections and tests as required. Record types and locations of all defects found in the work. Record work required and performed to correct deficiencies. All test results to be submitted to Fluor Fernald.
   b. Perform visual inspection of all welds per AWS D.1.1.
   c. All welds that fail shall be repaired per approved Contractor AWS Welding Program.
   d. Reworked areas shall be re-tested using the same method as used to find original indications.

2. Perform nondestructive tests of welds per AWS D.1.1. Full penetration welded connections on structural steel rigging frame utilized for critical lifts, as defined in the FEMP Hoisting and Rigging Manual, shall be 100 percent radiograph tested by an independent certified testing lab. Results shall be submitted to Fluor Fernald for approval.

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a. All welds that fail testing shall be repaired per approved Contractor AWS Welding Program.
b. Reworked areas shall be re-tested using the same method as used to find original indications.

E. Correction of Substandard Work:

The Contractor shall correct deficiencies in structural steel work which inspections and laboratory test reports have indicated to be not in compliance with requirements.

END OF SECTION

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SECTION 05126

STRUCTURAL STEEL DISMANTLEMENT

PART I GENERAL

1.1 SCOPE

This Section includes dismantling and containerization of:

A. Structural steel,
B. Bar joists,
C. Floor plate/decking,
D. Grating,
E. Stairs, ladders, and handrail,
F. Metal siding and roofing, including doors, louvers, and windows,
G. All other miscellaneous steel, and
H. Control of fugitive emissions.

1.2 RELATED SECTIONS

A. Section 01120 - Debris/Waste Handling Criteria
B. Section 01517 - Removing/Fixing Radiological Contamination
C. Section 03315 - Concrete/Masonry Removal
D. Section 07415 - Transite Removal

1.3 REFERENCE MATERIALS

See Part 7 for the following:

A. Index of Drawings,
B. Photographs,
C. Drawings, and
D. Contractor Safe Work Plan Format Requirements.

1.4 REFERENCES, CODES, AND STANDARDS

All work shall be accomplished in accordance with the following reference, code, and standard requirements:

A. American National Standards Institute (ANSI):

1. ANSI A10.6-90 Safety Requirements for Demolition Operations
2. ANSI A10.8-88 Construction and Demolition Operations - Scaffolding - Safety Requirements

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3. ANSI A10.13-89 Construction and Demolition Operations - Steel Erection

B. National Fire Protection Association (NFPA):

1. NFPA 241-96 Standard for Safeguarding Construction, Alteration, and Demolition Operations

C. United States Occupational Safety and Health Administration:

2. 29 CFR 1926.858 Removal of Steel Construction.

1.5 SUBMITTALS

The Contractor shall submit to Fluor Fernald for conformance review a structural steel removal Safe Work Plan in accordance with Part 7, ACR-002, Contractor Safe Work Plan Format Requirements, that contains the following information:

A. Detailed sequence of dismantlement and method of cutting, including equipment to be used.

B. Methods for contaminant control, including fugitive emissions during cutting.

C. Detailed plan for protecting lay down and cutting areas from contamination by lead paint chips and for controlling airborne radiological emissions.

D. Methods and materials used for cutting lead-painted steel.

E. If structural steel is removed in sections, verify the structural adequacy of the remaining structure. Calculations and drawings to verify the structural integrity of the partially dismantled structure must bear the stamp of a Professional Engineer registered in the State of Ohio.

F. Plans for personnel tie-offs, use of pick boards and walking on or near roof purlins/girders.

G. If controlled explosive methods are used for structural steel dismantlement, a detailed Safe Work Plan containing the following information shall be prepared:

1. Methods and materials to be used.

2. Means to protect adjacent structures, equipment, material, and underground utilities from damage, including protection from projectiles.

3. Methods and materials to control fugitive emissions.

4. Contingency plan for detonation failure and safe recovery of all undetonated charges.

5. Proof of permit, issued by the Bureau of Alcohol, Tobacco and Firearms, to use explosives.

6. Evidence of previous work experience using controlled explosives to take down multi story structures within the last 5 years. This experience may be shown through the sub-tier contract. Provide project locations and contacts for verification.

7. If non-load bearing interior concrete/masonry walls are to be removed, refer to concrete/masonry removal specifications in Section 03315.

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8. Identify locations of all cuts and charges and detonation sequence on composite drawings which will be provided by Fluor Fernald.

9. Provision of adequate protection of charges to prevent shrapnel from damaging the non-electric detonation system or persons near the exclusion boundary.

10. Predications of rubble/debris piles should be made to ensure that safe exclusion zones are established.

PART II PRODUCTS

2.1 MATERIALS

A. Non-woven Geotextile Fabric:

1. Trevira Spunbond 1120 by Hoechst Celanese Corp.

2. Mirafi 160N by Mirafi Inc.

3. ADS 600 by Advanced Drainage Systems, Inc.

4. Fluor Fernald-approved equal products

B. Surfactants:

1. CP-225 CHIL-SORB by Childers.

2. Fluor Fernald-approved equal products

PART III EXECUTION

3.1 PREPARATION

A. The Contractor shall ensure that adequate lay down space has been cleared and barriers have been established.

B. Building contents, steel, and siding shall have contamination removed or fixed prior to exposing interior surfaces including steel and siding to the environment in accordance with Section 01517.

C. If controlled explosive methods are used, the Contractor shall take precautions to control fugitive emissions by saturating the explosion footprint with water 2 to 4 hours prior to the implosion.

3.2 APPLICATION

A. All dismantlement activities shall be performed in accordance with the standards listed in Article 1.4.

B. The Contractor shall apply mechanical means of cutting and removing the structural steel to the largest extent possible while also avoiding damage to adjacent structures, components, equipment, and utilities.

C. The roof deck and roofing material, panels and concrete floor decking shall also be demolished with the structure wherever possible. Roofing material containing asbestos containing material (ACM) shall not be demolished with structural steel.

D. The Contractor shall dismantle, shear and segregate the structural steel to avoid damage to adjacent structures, component, equipment, and utilities. The Contractor shall minimize bending, twisting, and smashing of the steel during segregation and bulk storage.

E. Control of fugitive emissions shall be maintained at all times during this removal work to minimize visible dust.

F. All temporary bracing and rigging frames required shall be designed and stamped by a State of Ohio Professional Engineer, then submitted with calculations to Fluor Fernald for review and approval.

G. Cut all reinforcing (e.g., rebar) and anchors flush with base slab for areas designated on the Civil Demolition Plan for potential debris stockpiling. For all other areas, reinforcements and anchors need only be cut down to within one inch of the base slab. Fill in damaged areas of base slab with patching grout as described in Section 01515.

H. Lead-based paint chips and debris, released during structural steel dismantlement, shall be collected and managed in accordance with Section 01120 and the Waste Management Plan located in Part 6, Exhibit E.

3.3 SPECIAL INSTRUCTIONS

A. The following items are also included (where applicable) in the sequence of structural steel dismantlement:

1. Doors, Windows, and Frames:

   a. The Contractor shall remove all windows in one piece and place them in appropriate containers.

   b. The Contractor shall remove all doors (wood and/or steel) and place them in appropriate containers.

2. Lead Materials:

   a. The Contractor shall segregate all lead materials (i.e., flashing, vent stacks, etc.)and place them in appropriate containers in accordance with Section 01120 and the Waste Management Plan located in Part 6, Exhibit E.

   b. Prior to torch cutting on a surface coated with a lead-based paint, an eight inch strip of paint shall be removed at the area of the cut (i.e., 4 inches on each side).

   c. The Contractor shall (whenever possible) dismantle lead flashing in a manner that will facilitate recycling. This will include minimizing inaccessible surfaces and

maximizing straight lengths. This will also include avoiding the use of fixatives on the lead flashing that would require an abrasive method of removal.

B. All material shall be cut to meet sizing criteria and be managed in accordance with the Waste Management Plan located in Part 6, Exhibit E.

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3.4 QUALITY ASSURANCE

The Contractor shall inspect debris generation, stockpiling, and containerization to ensure that all materials have been cut to meet size criteria and are being managed in accordance with the Waste Management Plan located in Part 6, Exhibit E.

END OF SECTION

Approved: Joseph S. Stoner Date 9/

SECTION 07415

TRANSITE REMOVAL

PART I GENERAL

1.1 SCOPE

The work includes:

A. Removal of all interior and exterior transite panels.
B. Use of vacuuming, encapsulants, and/or surfactants on the transite panels to prevent airborne asbestos fibers and airborne radioactivity.

1.2 RELATED SECTIONS

A. Section 01120 - Debris/Waste Handling Criteria
B. Section 01515 - Mobilization, Demobilization, and General Site Requirements
C. Section 01516 - Asbestos Abatement
D. Section 01517 - Removing/Fixing Radiological Contamination
E. Section 15065 - Equipment/System Dismantlement
F. Section 15067 - Ventilation and Containment

1.3 REFERENCE MATERIALS

See Part 7 for the following:

A. Index of Drawings,
B. Photographs,
C. Drawings,
D. Contractor Safe Work Plan Format Requirements, and
E. HEPA Vacuum Cleaner Requirements.

1.4 REFERENCES, CODES AND STANDARDS

A. 29 CFR 1926.850 Demolition Preparatory Operations
B. 29 CFR 1926.1101 Asbestos (Construction Industry)
C. 29 CFR 1910.134 Use of Respirators
D. 29 CFR 1910.1001 Asbestos (General Industry)
E. Ohio Department of Health Asbestos Hazards Abatement Rules Chapter 3701-34, OAC (Ohio Department of Health)
F. Ohio Environmental Protection Agency Chapter 3745-20, OAC
G. United States Environmental Protection Agency (U.S. EPA) 40 CFR 61 SubpartM (NESHAPS)

1.5 SUBMITTALS

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A. The Contractor shall submit to Fluor Fernald a detailed Safe Work Plan (SWP) for approval in accordance with Part 7, ACR-002, "Contractor Safe Work Plan Format Requirements" and "Asbestos Abatement Safe Work Plan Requirements". The submittal shall include the procedures proposed for use in complying with the requirements of this Section. An Ohio Certified Asbestos Abatement Project Designer shall prepare and approve the SWP. The SWP shall include the following information:

1. The location and layout of storage and queuing areas.
2. The method of applying vacuuming, encapsulants, and/or surfactants.
3. The methods and sequencing of interior and exterior panel removal.
4. The interface of trades involved in the performance of work.
5. A detailed description of the methods to be employed to prohibit visible emissions in the work area.
6. A detailed description of the methods for removing transite panels from the structures and moving them to the laydown location for containerization (per the Waste Management Plan/Material Segregation and Containerization Criteria (WMP/MSCC) located in Part 6, Exhibit E. The description of methods shall include methods to be employed to ensure transite panels are removed without cutting, abrading, or breaking.
7. Description of the portable HEPA ventilation system, the containerization of removed asbestos debris, the method of treating broken and/or damaged panels, and the method of protecting adjacent structures.
8. If dismantlement method requires personnel on the roof, the plan shall include calculations verifying the structural adequacy of the roof and roof penetrations to support personnel and equipment. These calculations shall be stamped by a Professional Engineer registered in the State of Ohio, consistent with Section 01515.
9. Plans for personnel tie-off, use of pick boards and walking on or near roof purlins/girders.

B. Prior to initiation of the work, the Contractor shall submit the following OSHA-required documentation for Asbestos Removal Contractors to Fluor Fernald:

1. Documentation of training,
2. Medical surveillance,
3. Respirator fit-test, and
4. Employee exposure assessments.

C. Five (5) days prior to submittal of notification to government agencies, the Contractor shall provide a copy to Fluor Fernald for concurrence.

D. Product Data: The Contractor shall submit for approval manufacturer's technical information, including application instructions for each material proposed for use.

1.6 HANDLING AND STORAGE

A. The Contractor shall manage transite in accordance with Section 01120 and the Waste Management Plan, located in Part 6, Exhibit E. Corrugated transite panels shall be stacked separately from flat transite panels.

B. The Contractor shall take precautions to prevent breakage of transite panels during handling.

000200

1.7 PROJECT CONDITIONS

Multiple layers of transite roof and wall panels require specific methods for removal/fixing of radiological contamination, which is likely to exist between the layers of transite. Section 01517 contains specific instructions for removing/fixing contamination during removal of transite roof or wall panels.

Whenever transite (or transite fastener) removal is occurring on roofs, no one will be allowed within the footprint of the building until such work activities are completed.

As exterior transite panels are removed, the associated structural steel shall be considered to be contaminated with asbestos fibers, and therefore shall require encapsulation with lockdown material.

Refer to Section 01516 for information regarding the handling of deteriorated transite.

PART II PRODUCTS

2.1 MATERIALS

A. Deliver materials in original, new, and unopened containers bearing manufacturer's name, label, and the following information:

1. Name or title of material,
2. Manufacturer's stock number and date of manufacture,
3. Manufacturer's name, and
4. Thinning and application instructions.

B. Encapsulants/Lockdowns:

1. Control – Grayling Ind.
2. Foster 32-60 – Foster Products Corp.
3. Fiberset PM – Fiberlock Technologies
4. ACC 22-P – American Coatings Corp.
5. Serpiloc
6. Approved equal

Note: Encapsulants shall have a coloring agent or dye so that, when applied, there is obvious verification that a coating has been applied.

C. Surfactants:

1. CP-225 CHIL-SORB by Childers
2. Fluor Fernald-approved equal products

D. Fiber-reinforced polyethylene or polyester sheeting approved for outdoor storage; color, yellow; minimum thickness of 6 mils; ultraviolet resistant, as manufactured by Griffolyn or Herculite.

E. Or equal, as approved by Fluor Fernald.

PART III EXECUTION

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3.1 PREPARATION

A. Regulatory:

1. When applicable, the Contractor shall notify the Ohio Department of Health (ODOH) and Fluor Fernald shall notify the EPA and all other applicable governmental agencies before the start of work.
2. The Contractor shall adhere to and comply with work practices and procedures set forth in the most current and applicable Federal, State, and local codes, regulations, and standards.
3. The Contractor shall obtain certifications and licenses if transite becomes friable.

B. Consistent with Section 01517, prior to opening a building to the environment by removing the exterior siding (e.g., transite, metal siding, roof panels), the Contractor shall remove and/or fix radiological contamination on all surfaces within the facility until the detected radioactivity levels are below the criteria defined in Part 8, Section 8-C 2.4.

3.2 APPLICATION

A. The Contractor shall apply encapsulants, and/or surfactants according to the product manufacturer's specifications for application conditions (e.g., temperature).

B. Where transite panels show significant deterioration, which results in potentially friable surfaces, panels shall be removed in accordance with Section 01516.

C. Apply encapsulant and/or surfactant to areas around fasteners of transite panels before removal of fasteners.

1. Fasteners are required to be removed or cut without damaging the transite panel. A flat, sharp instrument shall be used to cut the fasteners.
2. When encapsulant and/or surfactant is applied, it shall be applied to provide visible coverage. If original application of surfactant becomes dried out before or during removal or handling, apply a second application.

D. Prior to removal of transite panels, all surfaces of the panels shall be thoroughly encapsulated.

1. Bodily contact with the panels, as practical, shall be avoided.
2. When dust is observed between panels, collect the dust with a HEPA-filtered vacuum.
3. In the event a transite panel is broken or deteriorated, the Contractor shall apply encapsulant and/or surfactant to the edges of deteriorated areas.
4. Removed transite panels shall be encapsulated on both sides by the end of the work shift.

E. Removal of transite roof panels shall be sequenced to minimize exposed underlying surfaces.

F. Cleanup procedures:

1. Remove and containerize all visible accumulations of asbestos containing material (ACM) and asbestos-contaminated material.

000202

2. Wet clean all surfaces in the work area.
3. Inspect the work area for visible residue.
4. The work area shall be cleaned until visual inspection reveals no evidence of any ACM as determined by Fluor Fernald.

3.3 SPECIAL INSTRUCTIONS

A. Single and Multiple Transite Layers:

Surfaces adjacent or between transite layers shall be considered radiologically contaminated. Refer to the requirements contained in Section 01517 for removing/fixing radiological contamination on transite panels.

B. Gutters:

The Contractor shall collect all ACM from gutters using wet methods, and shall apply an encapsulant and/or surfactant to the gutters before their removal.

C. Insulation:

1. The Contractor shall remove the mineral wool insulation between the transite panels and/or other materials.
2. The Contractor shall use dust control techniques (minimum of applying amended water) to minimize airborne contaminants generated during insulation removal.

D. Windows and Doors:

1. The Contractor shall remove all windows in one piece and place them in appropriate containers.
2. The Contractor shall remove all doors (wood and/or steel) and place them in appropriate containers.

E. Lead Materials:

1. The Contractor shall segregate all lead materials (i.e., flashing, vent stacks, etc.) and place them in appropriate containers in accordance with Section 01120 and the Waste Management Plan located in Part 6, Exhibit E.
2. Prior to torch cutting on a surface coated with a lead-based paint, an eight-inch strip of paint shall be removed at the area of the cut.
3. The Contractor shall (whenever possible) dismantle lead flashing in a manner that will facilitate recycling. This will include minimizing inaccessible surfaces and maximizing straight lengths. This will also include avoiding the use of fixatives on the lead flashing that would require an abrasive method of removal.

F. All material shall be managed in accordance with the Waste Management Plan located in Part6, Exhibit E.

3.4 QUALITY ASSURANCE

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Mock-up: Prior to commencement of work, the Contractor shall provide for approval a Fluor Fernald-selected sample area of transite for approval, 10 feet by 10 feet in size, to demonstrate encapsulant and/or surfactant methods. The approved mock-up shall serve as a standard for the balance of the work.

END OF SECTION

000204

Approved: Joseph S. Stoner 9/4
Joseph S. Stoner Date

SECTION 15065

EQUIPMENT/SYSTEM DISMANTLEMENT

PART I GENERAL

1.1 SCOPE

A. This Section includes the Contractor's responsibility for removal or dismantlement of equipment and demolition debris from a facility and support systems within or outside a facility.

B. Segregation of demolition debris into various waste streams and preparation for containerizing shall be completed in accordance with the MSCC.

1.2 RELATED SECTIONS

A. Section 01120 - Debris/Waste Handling Criteria
B. Section 01515 - Mobilization, Demobilization, and General Requirements
C. Section 01516 - Asbestos Abatement
D. Section 01517 - Removing/Fixing Radiological Contamination
E. Section 15067 - Ventilation and Containment

1.3 REFERENCE MATERIAL

See Part 7 for the following:

A. Index of Drawings,
B. Photographs,
C. Drawings,
D. HEPA Vacuum Cleaner Requirements,
E. HEPA Air Filtration Device Requirements, and
F. Contractor Safe Work Plan Format Requirements.

1.4 REFERENCES, CODES, AND STANDARDS

All work shall be accomplished in accordance with the following reference, code, and standard requirements:

A. 29 CFR 1926.301 Hand Tools, and
B. 29 CFR 1926.302 Power Operated Hand Tools.

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1.5 SUBMITTALS

The Contractor shall submit the following for approval:

A. Detailed removal Safe Work Plan in accordance with Part 7, ACR-002, Contractor Safe Work Plan Format Requirements for dismantlement of equipment/systems.

B. Proposed location, and method of installation of all hoisting equipment, and specialized construction equipment submitted for approval by Fluor Fernald with the Safe Work Plan.

C. Safe Work Plan specific to the dismantlement of outdoor process or suspect process tanks and pipes in accordance with Part 7, ACR-002, Subcontractor Safe Work Plan Format Requirements, including:

1. Sequence of work,
2. Methods and materials to control spills and possible generation of fugitive emissions from opening and cutting operations,
3. Method to access tanks and pipes, including health and safety issues,
4. Methods of dismantlement,
5. Method to size reduce and segregate,
6. Locations of cutting and interim storage areas,
7. Equipment required,
8. Methods to seal equipment and pipe openings for each equipment type,
9. Method to be used if piping or equipment contains nitric acid,
10. Location for interim storage,
11. Allowable floor loads,
12. Catalog cut sheets, and
13. Drawings.

1.6 PROJECT CONDITIONS

Process material (i.e., green salt, yellow cake, black oxide) has been removed from process equipment to the maximum extent practical by Fluor Fernald prior to D&D activities. If process material in excess of films and precipitates is found during D&D activities, Fluor Fernald project management shall be notified for evaluation and determination of the existing condition, prior to disturbing the process material.

PART II PRODUCTS

2.1 MATERIALS

A. The Contractor shall supply all materials required to seal equipment openings, to prevent spillage and/or migration of contaminants, per requirements of this Section.

B. Fiber-reinforced polyethylene or polyester material approved for outdoor storage: color, yellow; minimum thickness of 6 mils; ultraviolet resistant; as manufactured byGriffolyn, Herculite, or Fluor Fernald-approved equal.

PART III EXECUTION

3.1 APPLICATION

A. The Contractor shall supply all tools, materials, and equipment necessary for the performance of the work.

B. The Contractor shall use mechanical means of cutting whenever possible.

C. Prior to equipment/system dismantlement, the Contractor shall take the necessary actions to preclude spillage of residual material, if encountered. This shall include the temporary sealing of openings, pipe ends, etc. For liquid processing systems perform the following actions:

1. Piping shall be walked down before dismantlement;
2. Piping shall be nicked at identified low points and at other cut points
3. Piping will be secured to allow pipe to remain level during cut process
4. If liquid residual material is encountered,

    a. immediately stop
    b. contain the spillage in a container compatible with the liquid
    c. avoid making physical contact with liquid/material
    d. notify RCT and Industrial Hygiene (IH)

D. Prior to cutting into tanks or piping where the potential for flammable lining exists, it shall be the Contractor's responsibility to verify that no lining exists. Should the Contractor find lined pipes or tanks, the pipes or tanks shall be cut and removed by mechanical means and shall not be torch cut.

E. In some cases, equipment may be elevated from the ground by the means of a structural platform. In these cases, the equipment should be cut away or disconnected from the platform and lowered to the ground. The dismantlement of this equipment shall be accomplished by shearing and cutting whenever possible. If this is not possible, the equipment shall be dismantled at convenient assembly joints.

F. Fluor Fernald Radiological Control shall be contacted prior to performing any torch cutting on contaminated surfaces.

G. Prior to cutting into piping or equipment known or suspected of containing nitric acid or other corrosive, toxic, flammable or combustible material, such systems shall be purged to remove any potentially explosive or otherwise potentially harmful gases.

H. Equipment that can be removed in one piece during dismantlement of the building will be identified in Part 6, Section 3.1; however, handling of such equipment must still follow all other applicable requirements in Section 01120.

I. Uncontrolled dropping of equipment and materials is not allowed.

J. Piping insulated with asbestos may be removed in its entirety per the requirements of Section 01516.

K. The Contractor shall take the necessary actions to preclude spillage of residual material, if encountered.

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L. Debris segregation, sizing, and management shall be in accordance with Section 01120 and the Waste Management Plan located in Part 6, Exhibit E.

M. HEPA-filtered local ventilation shall be implemented for disassembly and sizing of process and suspect process pipe and equipment and for all burning (e.g., torch cutting) activities on contaminated surfaces.

3.2 SPECIAL INSTRUCTIONS: REMOVAL OF PERCHLORIC ACID FUME HOOD DUCTING

Perchloric acid hoods are located in the Laboratory (Building 15) in rooms 157, 165, 168, 169, 192, 206, 207, 209, 213, and C-31; and also in room 213 of the Health and Safety Building (Building 53A).

These hoods were designed for the exclusive use of perchloric acid. There is a possibility that other chemicals were used in these hoods, and that the water washdown system was not used during all operations. Therefore, there exists a potential for the formation of explosive perchlorate compounds.

It is because of this potential that a process must be used to minimize the possibility of an explosive decomposition occurring during the demolition process.

Therefore, in addition to those listed in Article 3.1 above, the following specifications apply:

A. Obtain a Safe Work Permit and Radiation Work Permit.

B. Ensure that each hood is both electrically and mechanically isolated.

C. Establish personnel control access; Signs, rope barriers, etc. (both in rooms and on roof).

D. Set up polyethylene sheets, drain tubes and bottles for water spray control, diking and drainage.

E. Using an "amended water" supply, spray the exhaust duct stack cover and damper. Continue for a minimum of two hours, keeping all joints, bolts, nuts, etc. wet. Continuously check drainage. Wet surfaces of ductwork until perchlorate crystals have dissolved and/or been rinsed away. Rinseate will be collected in accordance with Specification 01517. Allow surfaces to dry for inspection by Fluor Fernald. If crystals are no longer visible, the material can be disposed in accordance with uranium contaminated metal requirements. If crystals are still visible, the surface shall be cleaned again. If the visual inspection fails a second time, then the metal shall be disposed as process debris.

F. Set up electrically powered tools with ground fault circuit interrupters.

G. Cut plastic ducting with an "all type" saw. Keep water spray applied near the kerf of the saw blade. The first cut should be near the duct top, removing the damper and cover.

H. Repeat steps 5 though 8 for removal/cutting of ducting down to required distance.

I. Securely wrap/seal ducting with poly sheet/duct tape. Ensure that the duct is wet prior to wrapping.

J. Dispose of materials in accordance with Section 01120.

000208

3.3 SPECIAL INSTRUCTIONS: REMOVAL OF LABORATORY DRAINS

A. Before commencing removal operations of laboratory drains, ensure that the drain trap has been filled with water for at least the past two hours

B. Insert a stick into the drain, withdraw it, and touch it to a strip of litmus paper. Verify that the drain water is not significantly different from neutral pH by comparing the paper with the color chart enclose with the litmus paper. Record the indicated pH for each drain on the work permit.

C. Fluor Fernald personnel will check each drain to ensure that mercury vapor levels are not elevated.

D. If mercury is indicated, specify that the workers wear mercury vapor cartridges or combination HEPA/mercury cartridges (if radiological concern). Also, specify that personnel wear nitrile gloves, and equipment mercury and radiation contamination monitoring is required at the job's conclusion. All workers in the room must wear safety glasses and faceshields when unscrewing drain fittings, drilling, or hacksawing drains. Fluor Fernald personnel shall handle disposal of all recovered mercury.

E. If mercury is indicated, specify that removal of it from the bottom of the draintrap be attempted. Unscrewing a plug from the trap on those that are so equipped can do this. This should not be done, however, if crystals of any kind are evident on the cap threads. To catch the mercury and any water in the drain, a plastic tub should be used. After the drain is removed, inform Fluor Fernald personnel that disposal must be considered to be treated as RCRA hazardous waste, because mercury may have formed an amalgam with the drain metal.

F. Outside of drain pipes:

1. Wash off all drain fittings with soapy warm water.
2. If any crystals are evident on drain pipes or fittings (especially around lead or brass drains which may have formed lead peroxide from perchloric acid use), it is imperative that the drain not be disturbed in any way until the crystals are dissolved with warm water.
3. Crystals on the outside of the drain shall be removed by first soaking with a sponge, followed by brushing beneath a water spray.
4. If the crystals on the outside are dissolved, the drain may be removed by cutting it by mechanical means such as with a multi-turn pipe cutter, or hacksaw.
5. For removing drains, leather palm gloves worn over disposable vinyl plastic inner gloves must be worn and face protection is required from a face shield with safety glasses or full-face respirator. If there is a respirator requirement from a radiological safety standpoint, combination HEPA/Super cartridges should be selected.

3.4 SPECIAL INSTRUCTIONS: REMOVAL OF LEAD MATERIALS

A. The Contractor shall segregate all lead materials (e.g., flashing, vent stacks) and place them in appropriate containers in accordance with Section 01120 and the Waste Management Plan located in Part 6, Exhibit E.

B. There is lead shielding in Buildings 30A, 53A, and 53B. There is also cadmium shielding in Building 53B.

C. Prior to torch cutting on a surface coated with a lead-based paint, an eight inch strip of paint shall be removed at the area of the cut.

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D. The Contractor shall (whenever possible) dismantle lead flashing in a manner that will facilitate recycling. This will include minimizing inaccessible surfaces and maximizing straight lengths. This will also include avoiding the use of fixatives on the lead flashing that would require an abrasive method of removal.

3.5 INTERIM MATERIAL STORAGE

A. Where removed materials are staged or stored within the facility, they shall be stored in designated floor storage areas as described in Section 01120.

B. Damaged areas within facilities identified by the Contractor's Engineering Survey shall not be used for interim material storage.

3.6 QUALITY ASSURANCE

Calculations submitted on maximum allowable floor loading must bear the stamp of a Professional Engineer registered in the State of Ohio.

END OF SECTION

Approved: Joseph S. Stoner 9/4 Date

SECTION 15067

VENTILATION AND CONTAINMENT

PART I GENERAL

1.1 SCOPE

A. This Section consists of the work related to the Contractor-supplied ventilation and local containment that is required for radiological contamination purposes. The principal items included in this Section are:

1. Local containment and vestibule design requirements,
2. Ventilation requirements,
3. Types of ventilation/local containment design,
4. Guidance on type of ventilation/local containment applicability, and
5. Exterior items; such as dust collectors.

B. Definitions:

1. Local Containment – is an enclosure that is designed to maintain 0.1 inch water gauge negative pressure, or six air changes per hour, within its structure to prevent fugitive emissions from escaping to the outside environment.
2. Vestibule – is an enclosed entrance, a passage, or space that is between the outer door and the interior of the building. The space within the vestibule does not have to be under a negative pressure.
3. Enclosure – is the exterior wall of a building forming the containment.

1.2 RELATED SECTIONS

A. Section 01120 - Debris/Waste Handling Criteria
B. Section 01515 – Mobilization, Demobilization, and General Site Requirements
C. Section 01517 – Removing/Fixing Radiological Contamination
D. Section 03315 – Concrete/Masonry Removal
E. Section 05126 – Structural Steel Dismantlement
F. Section 15065 – Equipment/System Dismantlement

1.3 REFERENCE MATERIALS

See Part 7 for the following:

A. Index of Drawings,
B. Photographs,
C. Drawings,

D. Air Filtration Device (AFD) Procurement Specification, and
E. AFD Filter Procurement Specification.

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1.4 REFERENCES, CODES, AND STANDARDS

All work shall be accomplished in accordance with the following reference, code, and standard requirements:

A. United States Department of Energy (DOE):

1. DOE 5400.5 Radiation Protection of the Public and the Environment
2. DOE/EH 0256T Radiological Control Manual, April 1994

B. Energy Research and Development Administration (ERDA):

1. ERDA 76-21-79 Nuclear Air Cleaning Handbook

C. American Conference of Governmental Industrial Hygienists (ACGIH):

2. ACGIH Industrial Ventilation (latest edition)

D. American Society of Civil Engineers (ASCE):

3. OBBC Ohio Basic Building Code

1.5 SUBMITTALS

The Contractor shall submit a Safe Work Plan (SWP) in accordance with Part 7, ACR-002, Contractor SWP Format Requirements, with the following information to Fluor Fernald for approval:

A. Drawings and Data:

1. Indicate materials of construction, sizes, locations, entrances, and egresses that do not allow for breach of the local containment or vestibule, and all other details of local containments and vestibules to be erected.
2. Provide air flow diagrams for local containment and vestibule ventilation.
3. Submit calculations indicating that a minimum negative pressure of 0.1-inch water gauge or six air changes per hour is maintained in all local containments when the ventilation system is in operation.
4. If any part of the above affects or involves asbestos activities, the Ohio Department of Health/OSHA Asbestos Hazard Abatement Project Designer certification shall be part of the documentation submitted with the SWP.

B. Submit vendor information for performance, operation and maintenance on all accessory ventilation equipment that will be used.

C. Provide building-specific SWPs on the use of portable HEPA units including replacement of HEPA filters and prefilters.

000212

PART II PRODUCTS

2.1 MATERIALS

A. The Contractor shall provide:

1. Air cleaning devices,
2. HEPA elements,
3. Prefilter elements, and
4. All other ventilation accessory equipment for the completion of this project in accordance with Part 6, Section 4.0.

B. Polyethylene sheeting shall be clear and have a minimum of 6 mils thickness as manufactured by Blueridge Films, Inc. or Fluor Fernald approved equal.

1. Fire retardant polyethylene shall be used.
2. All outside containments shall be constructed of reinforced polyethylene.

PART III EXECUTION

3.1 EXAMINATION

A. All vestibules, equipment, and/or structure containment material shall be fire resistant and corrosion resistant.

B. Local containment structures shall be designed to be leak-tight and capable of maintaining a negative pressure of at least 0.1 inches water gauge or six air changes per hour. Typical design for various local containments should include the following features, where applicable:

1. Windows and mountings,
2. Glove ports,
3. Ease of cleaning,
4. Interior illumination per 29CRF 1926.56,
5. Connections for services lines, conduits, instrument leads, and ductwork,
6. 6 mil polyethylene sheeting,
7. Pressure differential readouts, and
8. Attachments for interconnection of local containments.

C. Where practical, and without penetrating the local containment, all equipment components not functionally required to operate directly in the presence of radioactive materials shall be located outside the local containment.

D. The local containment or vestibule structure external to the building shall be designed to withstand the effects of normal operating conditions and the following load capacities:

1. Interior: 5 psf lateral load, and
2. Exterior: per Ohio Basic Building Code (OBBC).

3.2 PREPARATION

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A. The Contractor shall enclose the structure and ensure that all building exterior holes, gaps, or openings are adequately sealed to prevent exhaust of airborne radioactive particulates.

B. The Contractor shall ensure that all ductwork used is free of dust or dirt before installing it in the ventilation system to prevent premature impingement loading of the prefilters and HEPA filters.

C. The Contractor shall ensure that all vestibules are large enough to support appropriate storage containers, material handling and dismantling equipment, and debris containerizing operations.

3.3 INSTALLATON/APPLICATION

A. The Contractor shall block, tie-down, or wheel lock all portable HEPA units.

B. The following guidelines for localized ventilation and in-place cutting control measures shall be adhered to by the Contractor:

1. The Contractor shall ensure that ventilation air is provided in the quantities required to maintain OSHA air quality limits, all Permissible Exposure Limits (PELs), and all ACGIH Threshold Limit Values (TLVs) and to maintain exposures As Low As Reasonably Achievable (ALARA).

2. For activities outside of enclosures, nuclear grade HEPA filters with a flexible ventilation duct shall be used as follows:

   a. Exhaust rate of the HEPA filters with a flexible ventilation duct shall maintain sufficient airflow capture velocity to prevent entry of fumes into the room. A minimum face velocity of 150 fpm is required.
   b. Each HEPA filter with a flexible ventilation duct in the cutting area should be capable of being isolated by means of control dampers to prevent backflow through a hood when it is not in service.
   c. The Contractor shall ensure that all local containments can maintain negative pressures. The exhaust volume rate shall be as required to attain 0.1 inch negative pressure within the containment. The exhaust air stream must be HEPA filtered. When containments are out-of-doors or border the outdoors, or are to be used for torch-cutting in the size reduction area, containments must have an airlock for the passage of equipment, personnel, and materials, so the main body of the containment is never directly open to the atmosphere. Other containments must be maintained such that there are no undesigned holes in the containment and the entrance/exit-way closes sufficiently to meet the air exchange/negative pressure requirements.

3.4 QUALITY ASSURANCE

Final acceptance of local containments, building enclosures, and vestibule structures shall be obtained from Fluor Fernald.

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END OF SECTION

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APPENDIX D

DESIGN DRAWINGS

Representative architectural and D&D design drawings were copied from the extensive set compiled for the design/procurement package and are presented in this appendix. Table D-1 lists the drawings included in this appendix. Additional detail drawings may be obtained per request, if needed. Descriptions of the buildings, systems and process areas illustrated in these drawings may be found in Section 3 of this Implementation Plan.

TABLE D-1 Multi-Complex D&D Drawings

DRAWING NO./ INDEX CODE	REV.	DESCRIPTION
02A-5500-A-01499	2	Plant 2 Digestion Area
02A-5500-A-01500	2	Plant 2 Digestion Area
02X-1450-A-00001	3	Architectural Plan & Elevations Ore Refinery Bldg. C1-1
02X-1450-A-00003	3	Architectural Plan of Ore Refinery, Bldg. C1-1
75D-5500-G-00018	16	Grid 19 Existing Site Plan
02C-7000-A-00831	3	Addition to Denitration Bldg., Plant 2
18X-3900-A-00805	0	General Sump Architectural, Control Bldg., Elev. & Sect
18X-5500-A-01165	1	Bldg. 2B, General/Refinery Sump Control Bldg., 1st Flr.
02E-5500-A-01971	0	Plant 3, Bulk Lime Handling Systems, Architectural Elev
02D-7000-A-00581	10	Metal Dissolver Bldg., Plans & Elev.
02A-1450-S-00556	0	Conveyor Trench-Silos to Ore Refinery, Struct. Steel
03B-7000-A-00186	4	Electric Substation, Bldg. Extension, Plans, Elev., & Det.
03X-1450-A-00327	1	Plan for Ozone Bldg., Nitric Acid Recovery
03X-1450-A-00004	1	Arch. for Bldg. C1-4, Bldg. 3C
03X-5500-A-01027	1	Bldg. 3D, Nitric Acid Recovery Floor Plan
03X-1450-P-00087	4	Section A-A, Nitric Acid Recovery
02X-5500-A-03350	3	Bldg. 3E, Hot Raffinate Bldg. 1st Floor Plan
02X-1450-A-00055	2	Elev., Hot Raffinate Bldg. C1-2 Arch. & Structural
02G-1450-P-00286	3	Equip. & Piping Plan at El. 588, Ore Refinery Sump
08X-1450-A-00011	1	Arch. Plans & Elev. Scrap Plant 43-C
08X-5500-A-01165	1	Plant 3 Maintenance Shop

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TABLE D-1 Multi-Complex D&D Drawings (Cont'd)

DRAWING NO./ INDEX CODE	REV.	DESCRIPTION
08F-3900-A-02533	0	Rotary Kiln, Arch. & Exterior Elevations
08X-1450-S-00010	2	Concrete Plan & Details, Car Wash Pit & Filter Scrap Plt
08J-3900-A-02792	A	Drum Reconditioning, Ext. Elev. Sheet 1
08J-3900-A-02793	0	Drum Reconditioning, Arch. Ext. Elev. Sheet 2
08X-5500-A-01404	0	Plant 8 Storage Area, Drum Storage Bldg., Plan & Elev.
18X-3900-M-00730	2	General Sump, Plant 18, General Arrangement Plan – N
18X-3900-M-00731	0	General Sump, Plant 18, General Arrangement Plan - S
18D-5900-A-00463	1	BDN Facility Upgrade – Water Pollution Control Phase II
18D-5900-A-00456	1	BDN Facility Upgrade – WPC Phase II Floor Plan
18D-5500-A-01313	1	Bldg. 18H Biodenitrification Effluent Treatment System
18A-5500-M-01375	0	54K Gallon Methanol Tank (F-4) Details
21X-1450-A-00002	3	Well House Plan Elev. & Sections, Architectural
22G-5500-A-00427	4	Plant 22 Sewer Lift Station, Arch Arrangement & Detail
22D-1450-S-00126	0	Plans & Details of Truck Scale Pit and Approaches
34X-5500-P-00063	0	K-65 Storage Area, Flow Diagram of Trench Piping
26A-4445-A-00019	1	Pump Station, Fire Prot. System, Arch., Plan & Details
26A-4445-A-00020	1	Pump Station, Fire Prot. System, Arch., Elev. & Sect.
26B-5500-S-00241	0	350M D.E. Tank – 26B, Erection Diagram
39A-5500-A-00054	6	Incinerator Bldg., Plans & Elevations
45A-5500-A-00048	0	Lab. Machine Shop Bldg., Preliminary Layout, Bldg. 45
60X-4445-A-00005	2	Warehouse – Plant 8 Plans, Sections & Elevations

2-4059

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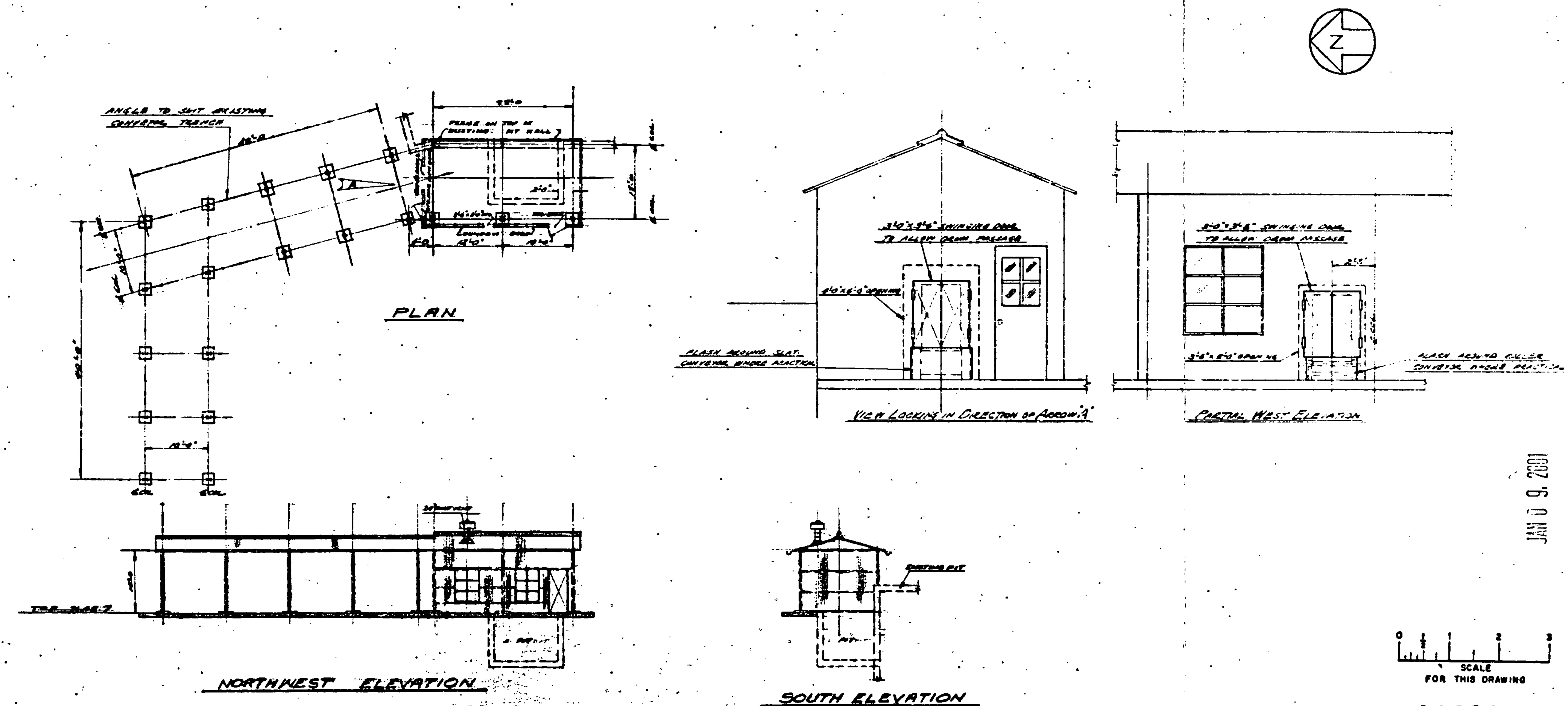


SCALE FOR THIS DRAWING

000218

NATIONAL LEAD COMPANY OF OHIO
FEED MATERIALS PRODUCTION CENTER
FERNALD, OHIO

U.S. ATOMIC ENERGY COMMISSION

PLANT 2 DIGESTION AREA
REVISED ORE HANDLING SYSTEM
HOUSE & RAIN SHELTER-HOT SYSTEM
ARRANGEMENT

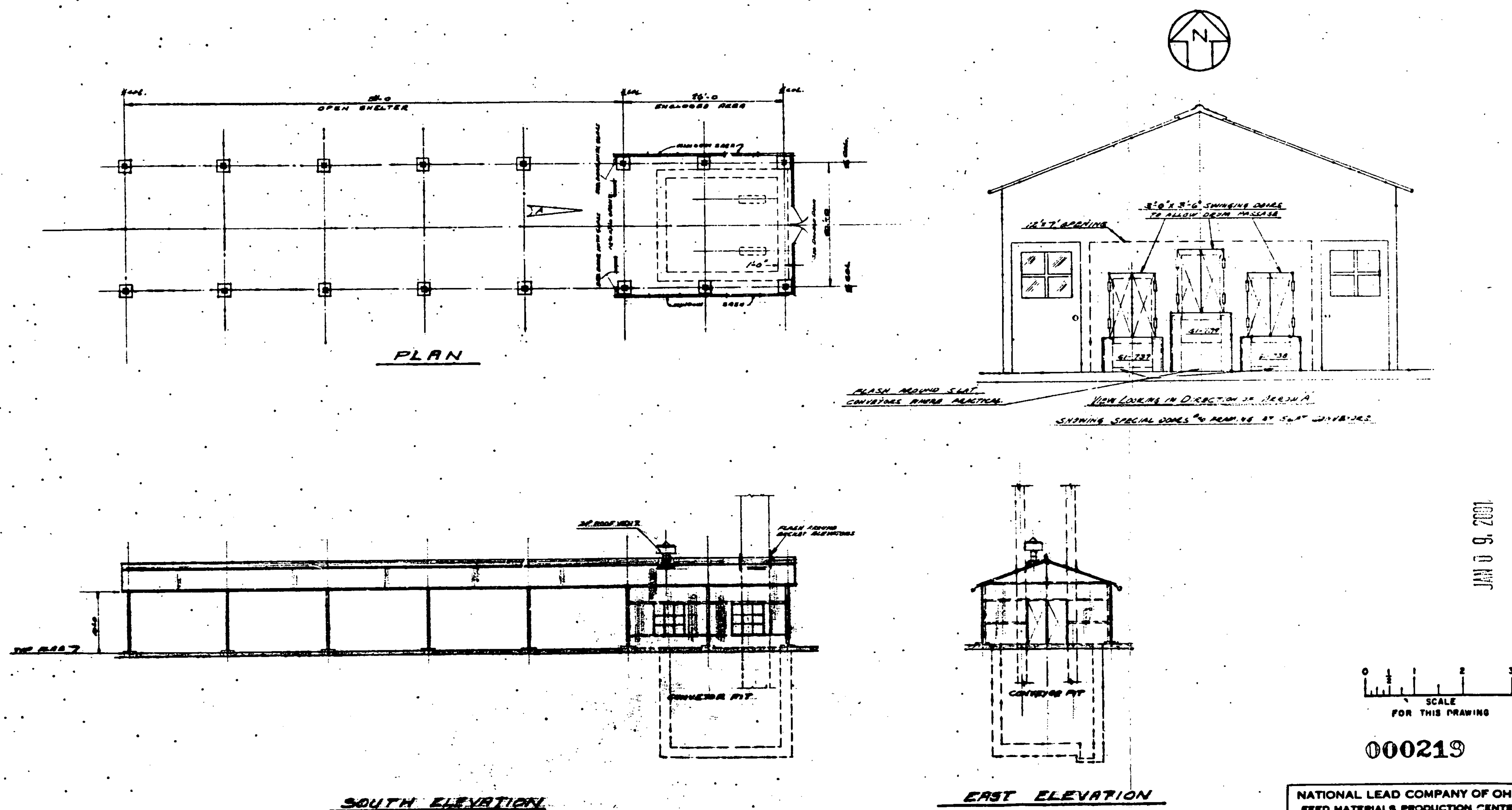
INDEX CODE			
PL. & AR.	DWG.	CL.	SER. NO.
02A	5500	A	01499

DEPARTMENT PRODUCTION
B.M. CP-F-54-47
DRAWN Q. VALLEI
DATE 5/24/54
DWG. NO. 2-4059

REF. DWG. NO.	REF. DWG. TITLE	NO.	REVISIONS	DATE	BY
		4			
		3			
2-4038	[illegible]	2			
2-4026	[illegible]	1			

2-4060

3873



000219

NATIONAL LEAD COMPANY OF OHIO
FEED MATERIALS PRODUCTION CENTER
FERNALD, OHIO

U.S. ATOMIC ENERGY COMMISSION

PLANT 2 DIGESTION AREA
REVISED ORE HANDLING SYSTEM
HOUSE & RAIN SHELTER-COLD SYSTEM
ARRANGEMENT

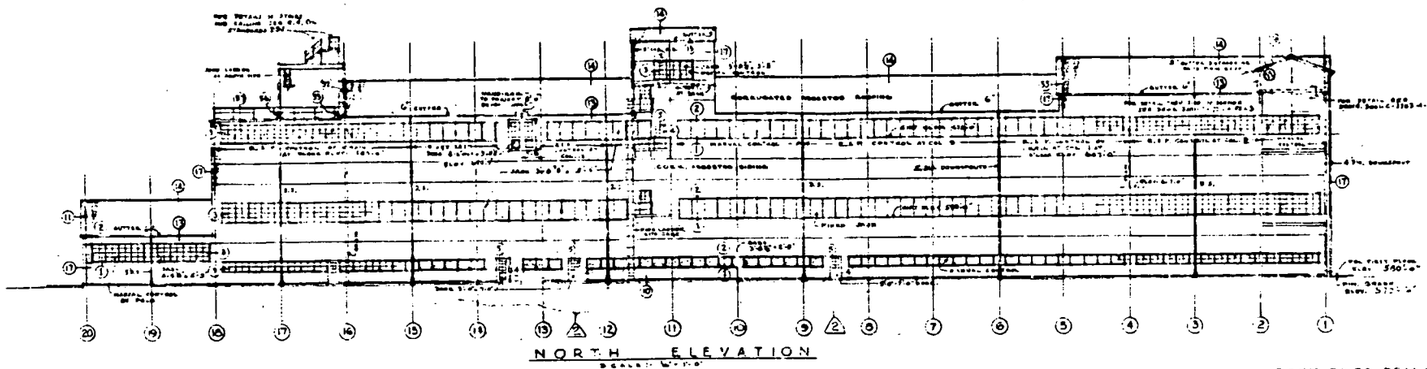
INDEX CODE			
02A	5500	A	01500

DEPARTMENT PRODUCTION
B.M. CP-F-54-47
DRAWN Q.VALLEI
DATE 8 24 54
DWG. NO. 2-4060

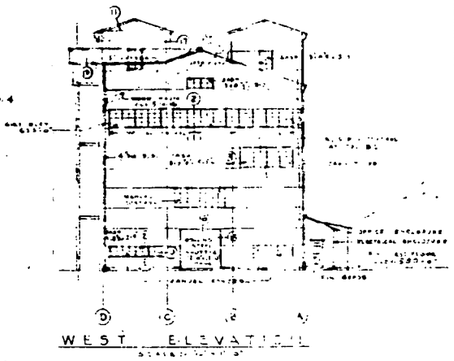
REF. DWG. NO.	REF. DWG. TITLE	NO.	REVISIONS	DATE	BY
		4			
		3			
2-4058	DRUM CONVEYOR LAYOUT-COLD SYS.	2			
2-4026	[illegible]	1			

3001-C-1001-A

3873

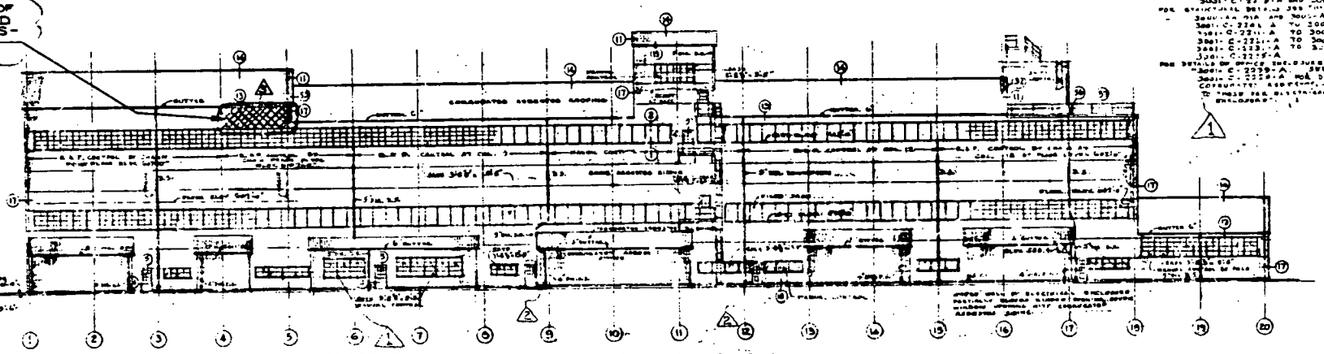


NORTH ELEVATION

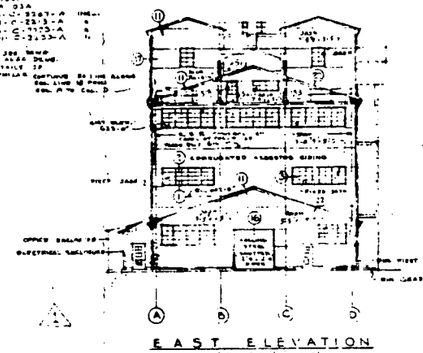


WEST ELEVATION

REMOVE & DISPOSE OF INTERIOR WALL BOARD & INSULATION IN CROSS-HATCHED AREA.



SOUTH ELEVATION



EAST ELEVATION

REFERENCE DRAWINGS

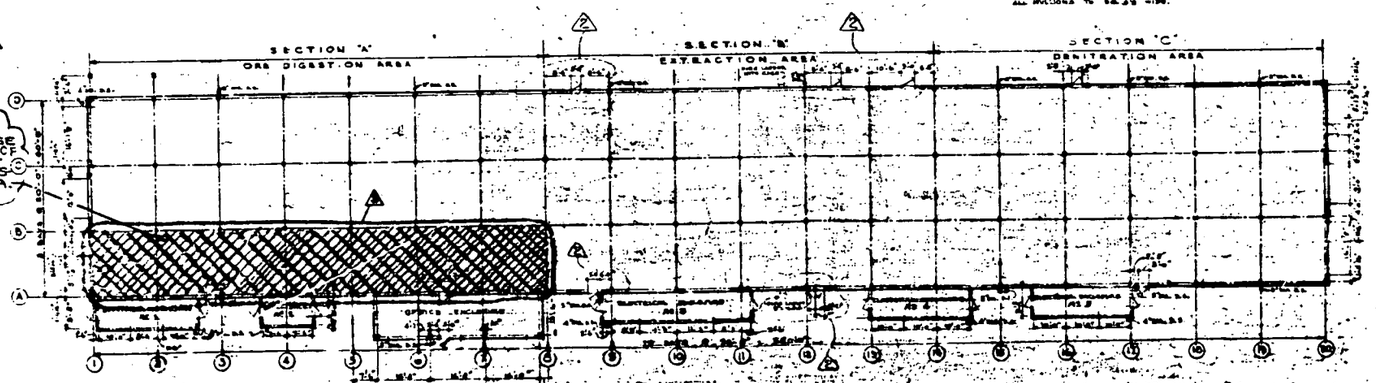
NOTE

NOTE

ABBREVIATIONS

TYPICAL DOOR OF ELECTRICAL ENCLOSURE

REMOVE & DISPOSE OF INTERIOR ROOF BOARD & INSULATION IN CROSS-HATCHED AREA.



PLAN

REDUCED DRAWING
DO NOT SCALE

ALL MATERIAL ON THIS DRAWING PURCHASED BY GEORGE A. FULLER CO.

INDEX CODE
STR | NSR | 000001

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

CONTRACT NO. AT(30-1)-1052

FEED MATERIALS PRODUCTION CENTER
FERNALD AREA

ARCHITECTURAL
PLAN & ELEVATIONS
ORE REFINERY BLDG. C1-1

4-15-52 — CATALYTIC CONSTRUCTION CO

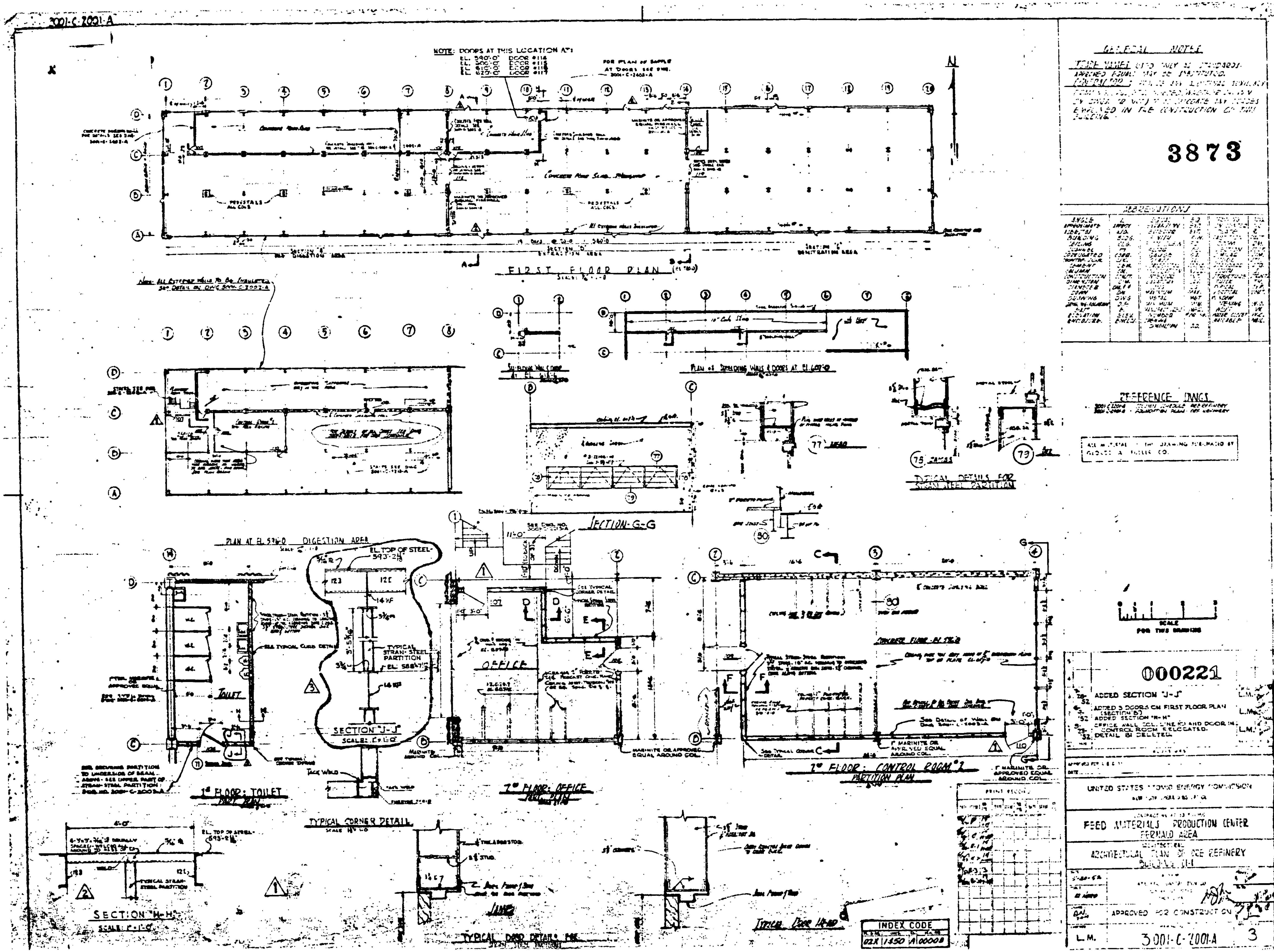
APPROVED FOR CONSTRUCTION

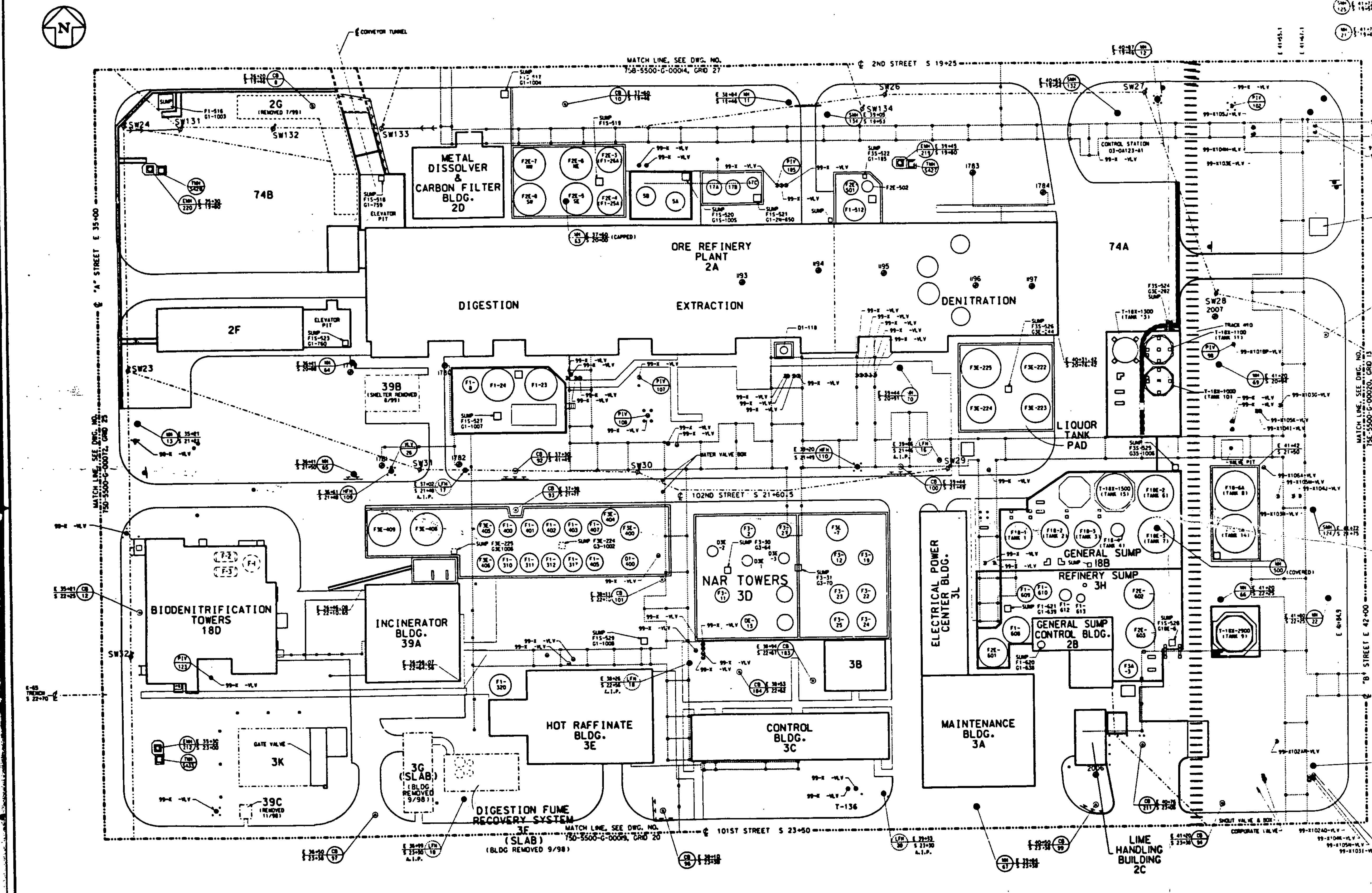
C.O.E.W. 3001-C-1001-A R 3

000220

FOR INFORMATION ONLY
CADD SERVICES

JAN 0 9 2001





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F18-2	18X-M-00003
F18-3	18X-M-00003
F18-4	18X-M-00004
F18E-2	18X-M-00030
F18E-3	18X-M-00030
F1-405	02E-M-00209
F1-310	02E-M-00198
F1-311	02E-M-00198
F1-312	02E-M-00198
F1-317	02E-M-00198
F1-400	02E-M-00207
F1-401	02E-M-00207
F1-402	02E-M-00207
F1-403	02E-M-00207
F1-608	02G-M-00238
F1-609	02G-M-00184
F1-610	02G-M-00184
F1-612	02G-M-00187
F1-613	02G-M-00185
F2E-3	02A-M-00588
F2E-4	02A-M-00588
F2E-5	02A-M-00798
F2E-6	02A-M-00798
F2E-7	02A-M-00798
F2E-8	02A-M-00798
F3E-404	02E-M-00208
F3E-405	02E-M-00208
F3E-406	02E-M-00208
F3E-408	02E-M-00800
F3E-409	02E-M-00800
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F3E-225	02C-M-00814
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F3E-225	[illegible]
F1-8	02A-M-00[illegible]
F1-24	02A-M-00216
F1-25	02A-M-00216
F1-512	02B-M-00222
F1-320	02E-M-00190
F2E-601	02G-M-00571
F2E-603	02G-M-00605
F3-22	03X-M-00043
F3-23	03X-M-00043
F3-24	03X-M-00043
F3-25	03X-M-00043
F3-2	03X-M-00046
F3-12	03X-M-00046
F3-19	03X-M-00046
F3-27	03X-M-00046
F3-8	03X-M-00041
D3E-1	03X-M-00157
D3E-2	03X-M-00157
D3E-3	03X-M-00157
T-18X-1000	18X-M-00082
T-18X-400	18X-M-00082
T-18X-1300	18X-M-01054
T-18X-2900	18X-M-01029

000222

FOR INFORMATION ONLY
CADD SERVICES

NO.	REVISIONS	DATE	DWN. BY	APPD.	NO.	REVISIONS	DATE	DWN. BY	APPD.	REF. DWG. NO.
					11	UPDATED	[illegible]	[illegible]	[illegible]	
					10	UPDATED ADDED TANK LIST	[illegible]	[illegible]	[illegible]	
16	GENERAL UPDATE	[illegible]	[illegible]	[illegible]	9	UPDATED	[illegible]	[illegible]	[illegible]	
15	GENERAL UPDATE	[illegible]	SG	[illegible]	8	ADDED PIV MMCS NOS.	[illegible]	[illegible]	[illegible]	
14	UPDATED	[illegible]	[illegible]	[illegible]	7	UPDATED	[illegible]	[illegible]	[illegible]	02X-5500-P-01704
13	UPDATED	[illegible]	SG	[illegible]	6	UPDATED	[illegible]	SJS	[illegible]	02X-5500-X-02546
12	UPDATED AND ADDED NOTE	[illegible]	[illegible]	[illegible]	5	REVISED GENERAL SUMP & BDN FACILITY.	[illegible]	[illegible]	[illegible]	75XG00027.DGN

NOTE: WEMCO C.A.D. DRAWING NOT TO BE REVISED MANUALLY

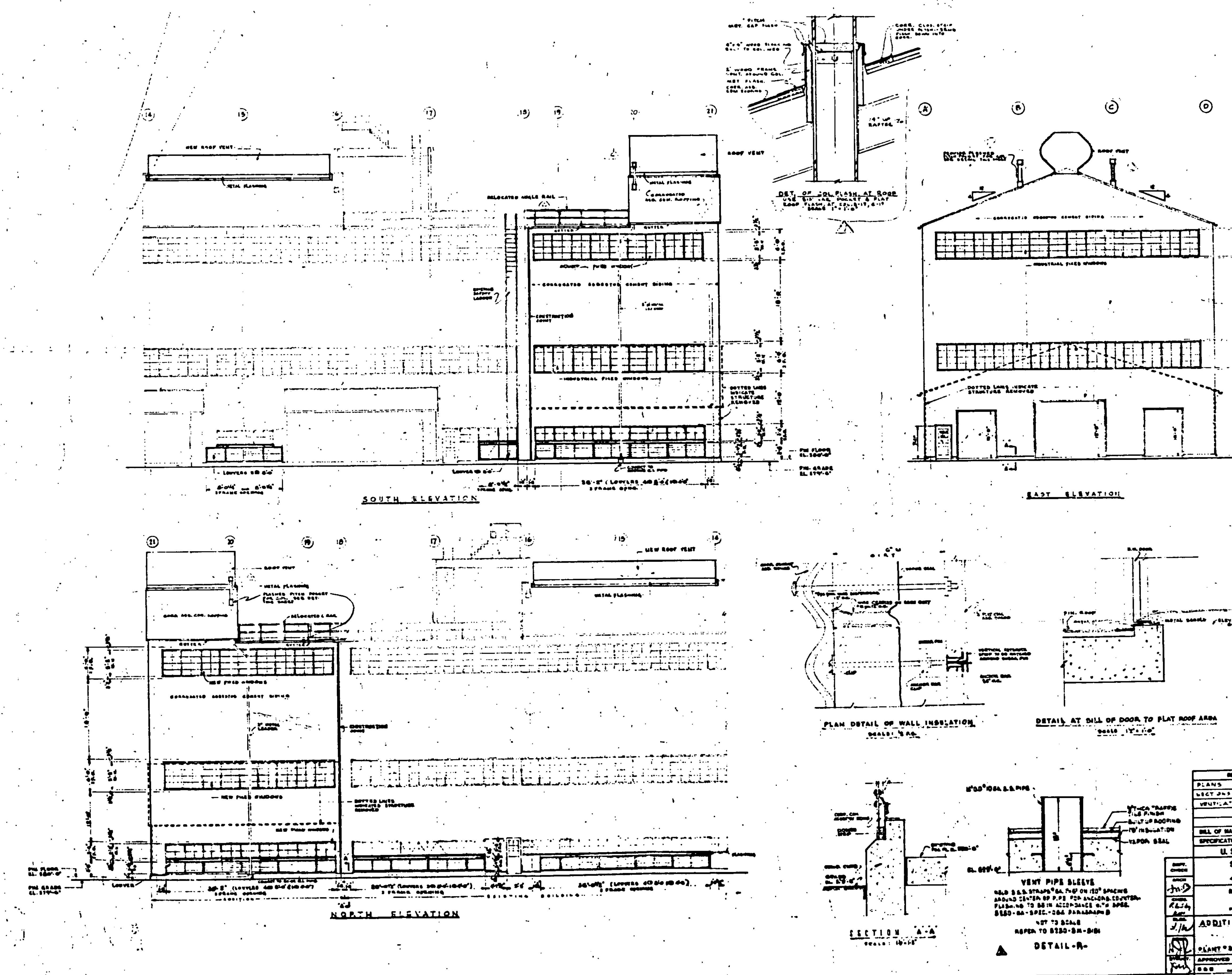
WESTINGHOUSE ENVIRONMENTAL MANAGEMENT CO. OF OHIO
FERNALD, OHIO
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
U.S. DEPARTMENT OF ENERGY

PLANT 2 & 3 — YARD AREA
GRID 19
EXISTING SITE PLAN
SCALE: 1"=20'

75D-5500-G-00018 | 16

FILE NAME: [illegible]

3873



000223

FOR INFORMATION ONLY
CADD SERVICES

JAN 0 9 2001

INDEX CODE
02C.7000 A

Drawing No. 5250-3A-5041 Rev. 3

REFERENCE DRAWING	NO.
PLANS	5250-3A-5040
SECTIONS & DETAILS	[illegible]
VENTILATION	[illegible]
BILL OF MATERIAL REF.	
SPECIFICATION REF.	

U. S. ATOMIC ENERGY COMMISSION

SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS
420 LEXINGTON AVE. NEW YORK 17, N. Y.

NATIONAL LEAD COMPANY OF OHIO
OPERATING CONTRACTOR OF
FEED MATERIALS PRODUCTION CENTER
FERNALD OHIO

ADDITION TO DENITRATION BLDG.
ELEVATIONS

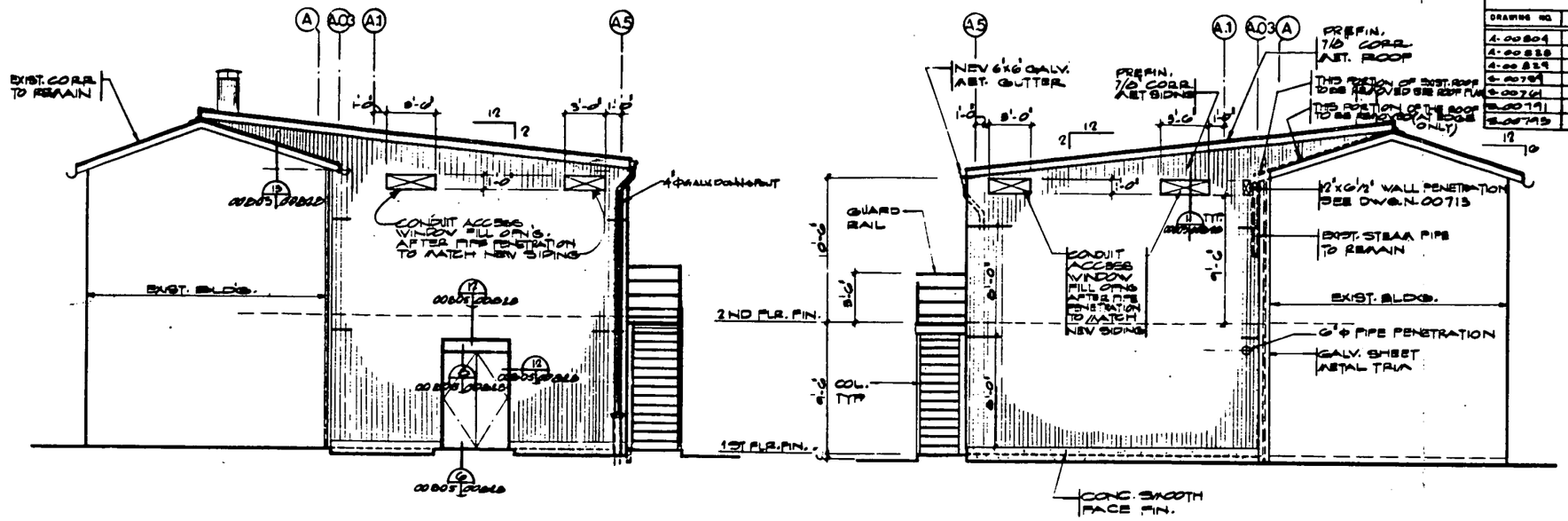
PLANT 9, ARCHITECTURAL DRAWING

APPROVED		DATE
S&B	[signature]	7-6-55
N.L.CO.	[signature]	7-11-55
A.E.C.	[signature]	

DRAWN CROLL, B.E. CHECKED [signature] 6-30-55
DATE 6-30-55 SCALE 1/8" = 1'-0"
DWG. NO. 5250-3A-5041 REV. 3

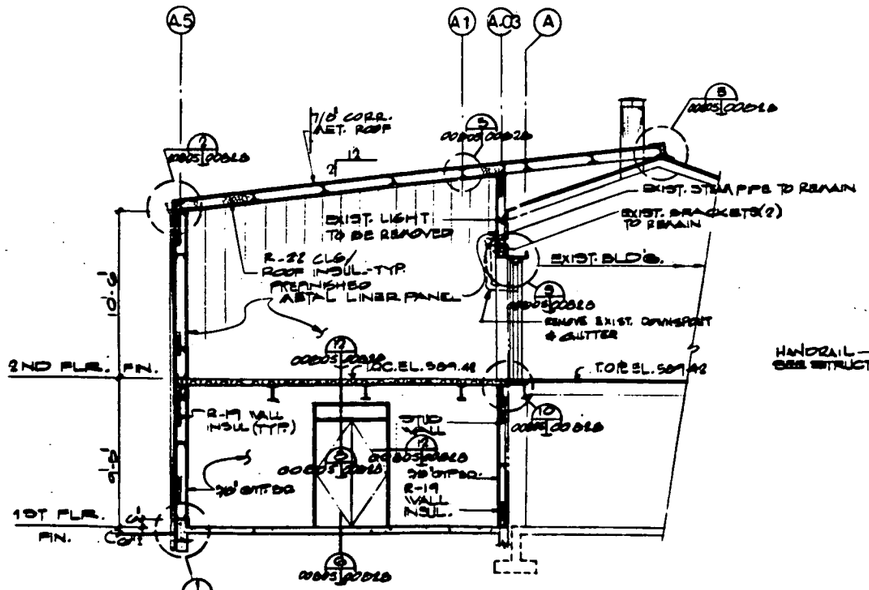
NO.	REVISIONS	DATE	BY	CHK.
3	ADDED DETAIL-A- VENT PIPE SLEEVE		JAN	
2	[illegible]		J.P.	
1	ISSUED FOR CONSTRUCTION		W.R.	JRC

FOR INFORMATION ONLY
CADD SERVICES

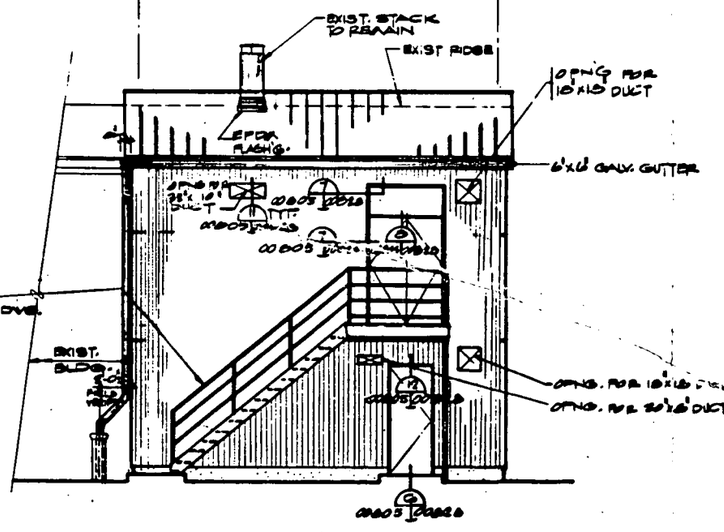


WEST ELEVATION

EAST ELEVATION



SECTION: A-A



FOR HVAC DUCT LOCATION SEE HVAC DWGS H-00807 & 00809

SOUTH ELEVATION

REFERENCE DRAWING	
DRAWING NO.	TITLE
A-00804	FLOOR PLANS
A-00830	DETAILS
A-00839	INTERIOR ELEVS
C-00789	PLANS & SECTIONS
C-00790	PLANS & ELEVATIONS
C-00791	GRADING
C-00795	DETAILS

3873

DO NOT SCALE REDUCED DRAWINGS

JUL 09 2001

CERTIFIED FOR CONSTRUCTION

UNITED STATES DEPARTMENT OF ENERGY

JACOBS ENGINEERING GROUP INC.
PASADENA, CALIFORNIA

CONTRACT NO N-77208 A-E NO 3900

PROJECT NAME
PRODUCTIVITY RETENTION

DRAWING TITLE
GENERAL SUMP ARCHITECTURAL
CONTROL BUILDING
ELEVATIONS AND SECTION

DRAWN BY	DATE	DETAILED CHECKED	DATE	CHECKED	DATE
ABS	5/00	WLH	5/00	WLH	5/00

PLANT	BLDG.	FLOOR	SCALE
FMPC			AS NOTED

SUBMITTED FOR APPROVAL — DATE 7-25-00

APPROVED RECOMMENDED — OPER. CONTRACTOR — DATE

DRAWING APPROVED — DOE — DATE 7/12/00

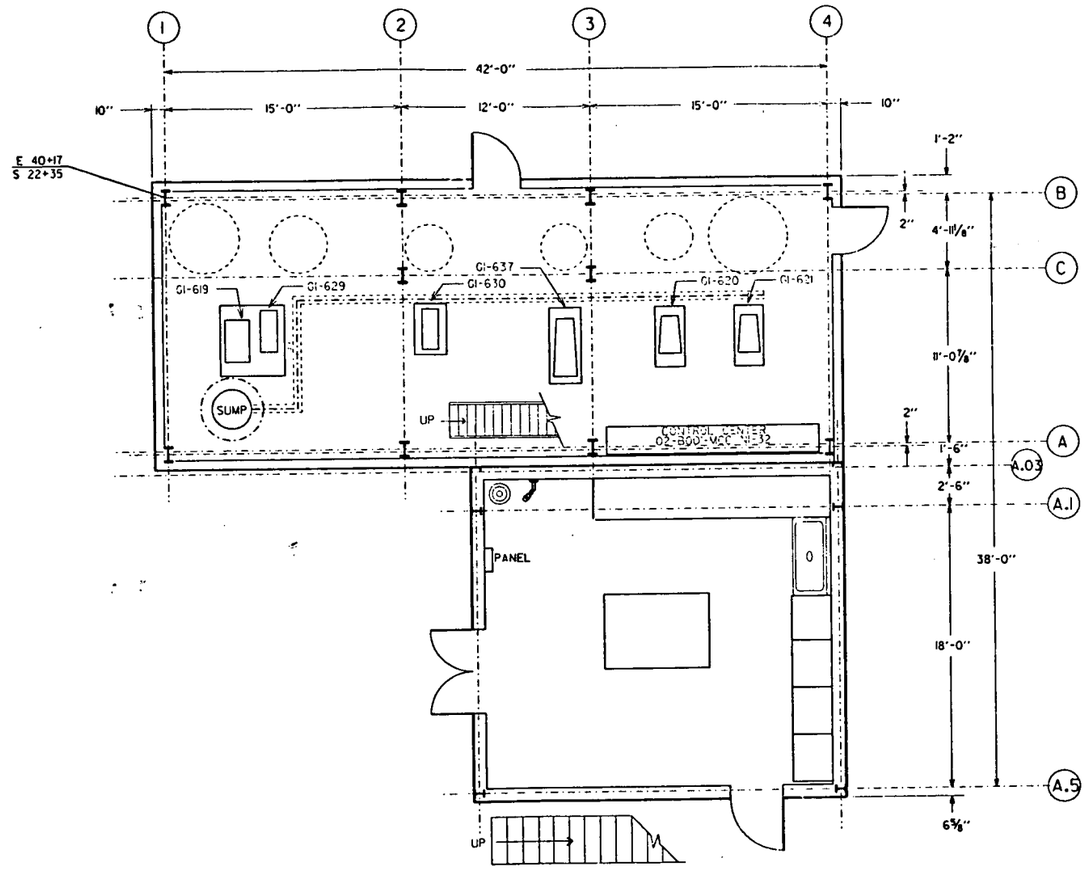
WBS CODE FOR INFORMATION ONLY

AS PROJECT NO.	USER 1	USER 2	PROJECT NO.	DRAWING NUMBER				REV NO.
01-836300005	X	A102	86-D-149	18X	3900	A	00805	0

00224

3873

FOR INFORMATION ONLY
CADD SERVICES



FLOOR PLAN
FIN FL EL 580'-5"

NO.	REVISIONS	DATE	DWN. BY	APPD.
1	REVISED TITLE BLOCK BLDG. NO. AND BLDG. DESCRIPTION	7/1/99	GEP	GEP

NO.	REVISIONS	DATE	DWN. BY	APPD.	REF. DWG. NO.

NOTE: WEMCO C.A.D. DRAWING NOT TO BE REVISED MANUALLY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± 1/16
ANGLES ± 0° - 30'
DECIMALS
.X ± 0.1
.XX ± 0.05
.XXX ± 0.005
.XXXX ± 0.0005
ORIG. RELEASE 04-95

APPROVALS			
CIVIL & STR.			SAFETY ENG.
ELECTRICAL			MAINTENANCE
ENGINEER			
INSTRUMENT			O.A.
MECHANICAL			
			FIRE PROTECT.
			WASTE MANAGE
CHECKED	GEP		D.O.E.
APPROVED	G.E. PAUL	1/8/92	SECURITY

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT CO. OF OHIO
FERNALD, OHIO
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
U.S. DEPARTMENT OF ENERGY

BUILDING 28 — FIRST FLOOR
GENERAL/REFINERY SUMP CONTROL BLDG.
FLOOR PLAN
1/4" = 1'-0"

RES. + MB		
DATE Nov. 8,'99	18X-5500-A-01165	1
DRAWN JSW		

FILE NAME: z:\FLOOR\28.DGN

000225

0210-6

GENERAL NOTES

STRUCTURAL STEEL:

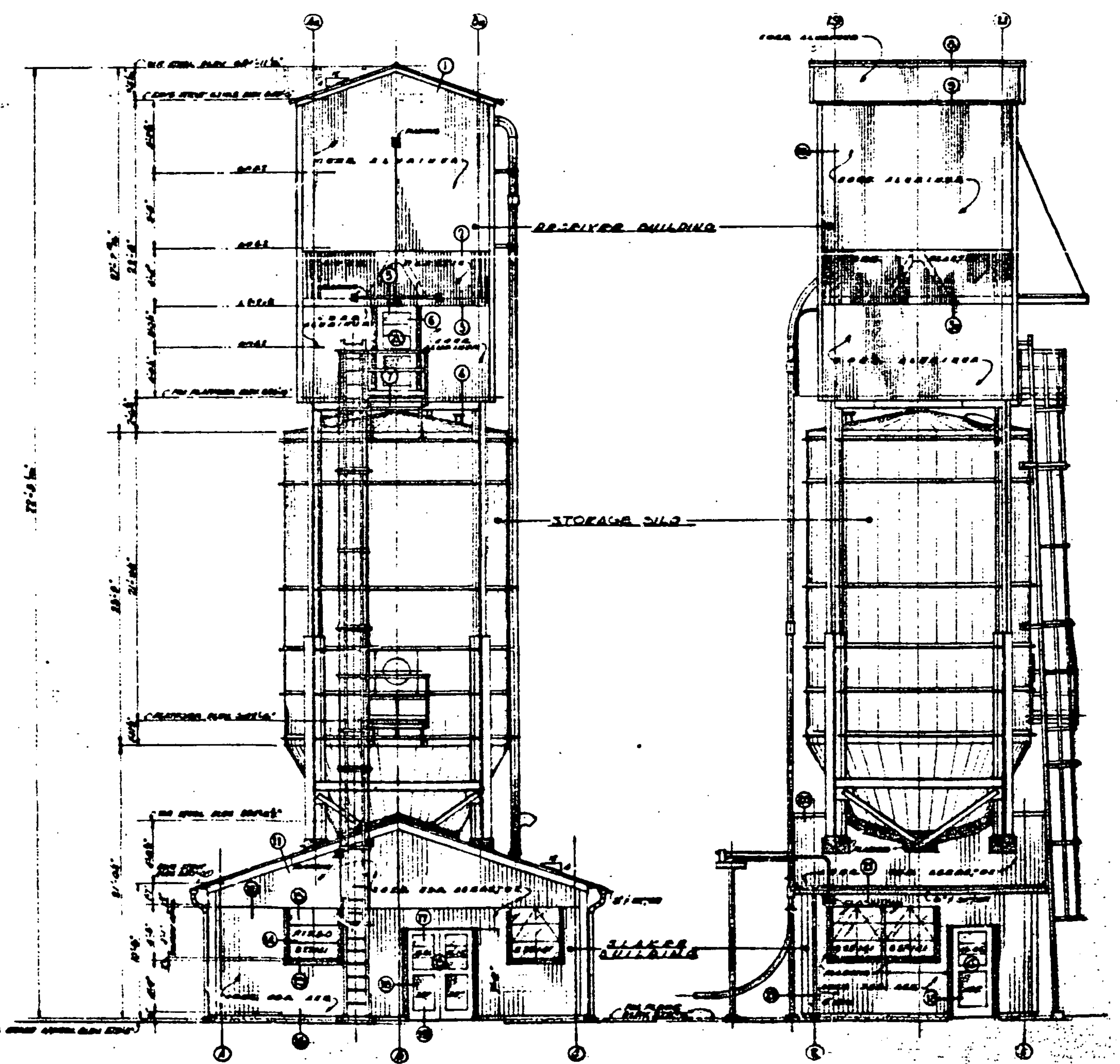
1. ALL ERECTION & CONNECTING BOLTS SHALL BE HIGH STRENGTH STEEL BOLTS. ALL WASHERS SHALL BE HIGH CARBON STEEL.
2. UNLESS OTHERWISE INDICATED, ALL FIELD CONNECTED BOLTS SHALL BE [illegible]

CONCRETE:

1. UNLESS OTHERWISE INDICATED ALL EXPOSED CONCRETE EDGES SHALL BE BEVELED [illegible]
2. REINFORCING STEEL [illegible] SHALL BE:
   - FROM BOTTOM OF [illegible] (EXCEPT PILE CAP) ---- 3"
   - FROM BOTTOM OF PILE CAP ---- [illegible]
   - FROM FACE OF WALLS FOR BARS #6 AND OVER ---- [illegible]
   - FROM FACE OF WALLS FOR BARS #5 AND UNDER ---- [illegible]
   - FOR TIES IN PIERS AND PEDESTALS ---- [illegible]

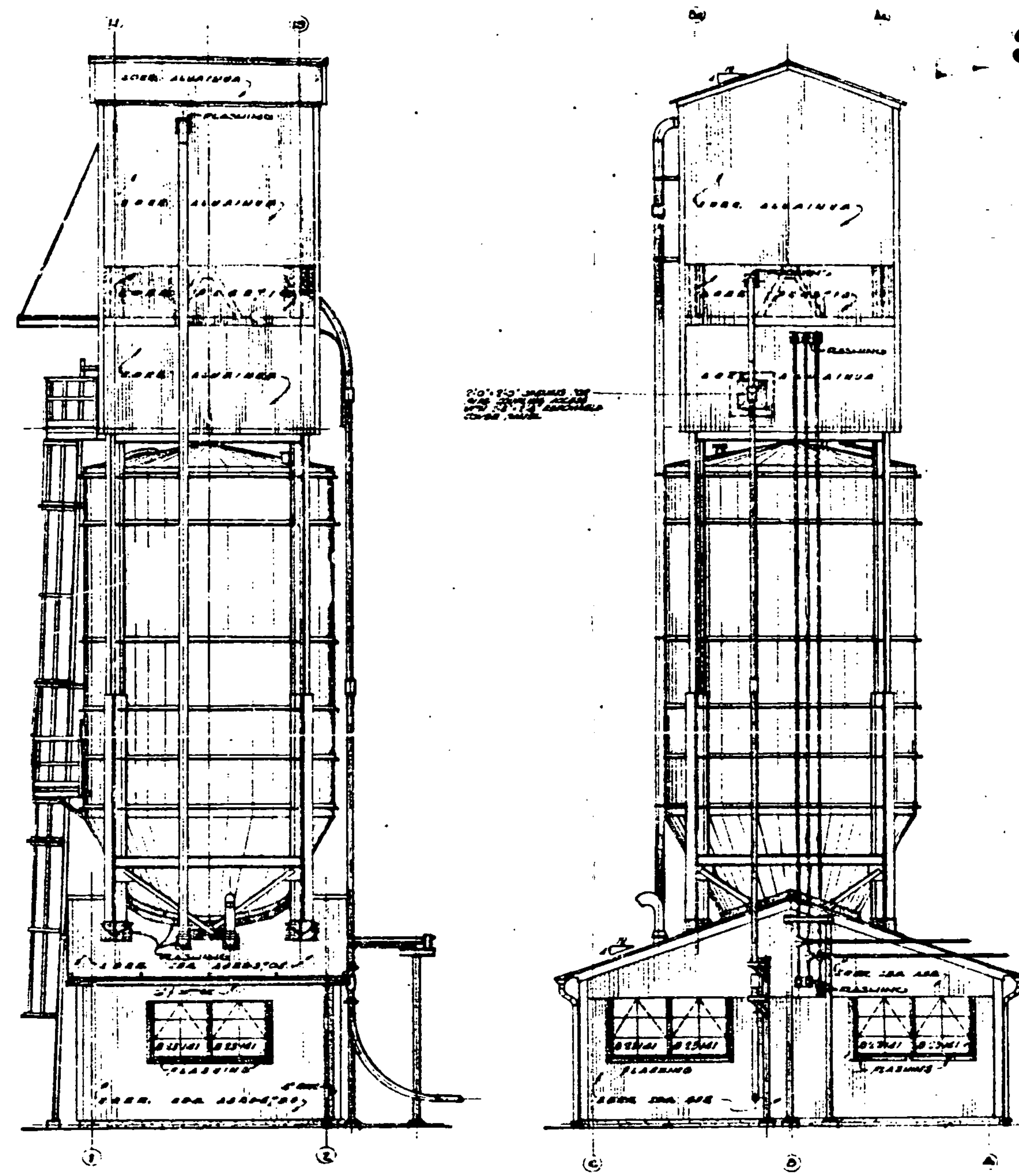
FOR INFORMATION ONLY
CADD SERVICES

3873



WEST ELEVATION
SCALE: 3/16" = 1'-0"

NORTH ELEVATION
SCALE: 3/16" = 1'-0"



SOUTH ELEVATION
SCALE: 3/16" = 1'-0"

EAST ELEVATION
SCALE: 3/16" = 1'-0"

JAN 0 9 2001

0 1 2 3
SCALE
FOR THIS DRAWING

DESIGN APPROVAL		
DIVISION	SIGNATURE	DATE
HEALTH & SAFETY	[illegible]	[illegible]
PRODUCTION	[illegible]	
TECHNICAL		
MAINTENANCE		
[illegible]	[illegible]	[illegible]

INDEX CODE			
PL. & UL.	DWG.	CL.	C.R. NO.
02E	5500	A	01971

3-4121	SECTIONS			
REF. DWG. NO.	REF. DWG. TITLE	NO.	REVISIONS	DATE	BY

000226

NATIONAL LEAD COMPANY OF OHIO
FEED MATERIALS PRODUCTION CENTER
FERNALD, OHIO

U.S. ATOMIC ENERGY COMMISSION

PLANT 5
BULK LIME HANDLING SYSTEM
ARCHITECTURAL
ELEVATIONS

ENGINEERING DIVISION

PROJECT NO. 3-54 | CP. 57-43
DRAWN V.M. LANCLAS | CHECKED [illegible]
TRACED J.E. [illegible] | APPROVED [illegible]
DATE 24 NOV 59 | DWG. NO. 3-4120 | DIVISION 0
SCALE 3/16" = 1'-0"

3873

FLASHING DETS AT SPACES 'C' 'D' 'E'

FLASHING DETS AT SUPPORT 'B'

METAL DISSOLVER BLDG.

EXISTING PLANT NO. 2

SITE PLAN

NOTE:

PLAN

WEST ELEVATION

SOUTH ELEVATION

EAST ELEVATION

SECTION

PLAN

SECTION A-A

PLAN-VENT UNIT SUPPORT

SECTION THRU SILL DOOR # 12,14,C,789

DOOR SCHEDULE

NORTH ELEVATION

DETAIL OF PIPE FLASHING THRU WALL

INDEX CODE

CO.	DEPT.	SUBJ.	DOC. NO.
02D	7000	A	00581

000227

REFERENCE DRAWINGS	NO.
HEATING & VENTILATING	5250-2A-707
PROCESS WATER, FIRE PROTECTION & PLUMBING	5250-2A-708
FENCE & MISC. WORKS	5250-266-4018
BILL OF MATERIAL REF.	
SPECIFICATION REF.	

U.S. ATOMIC ENERGY COMMISSION

SINGMASTER & BREYER

NATIONAL LEAD COMPANY OF OHIO

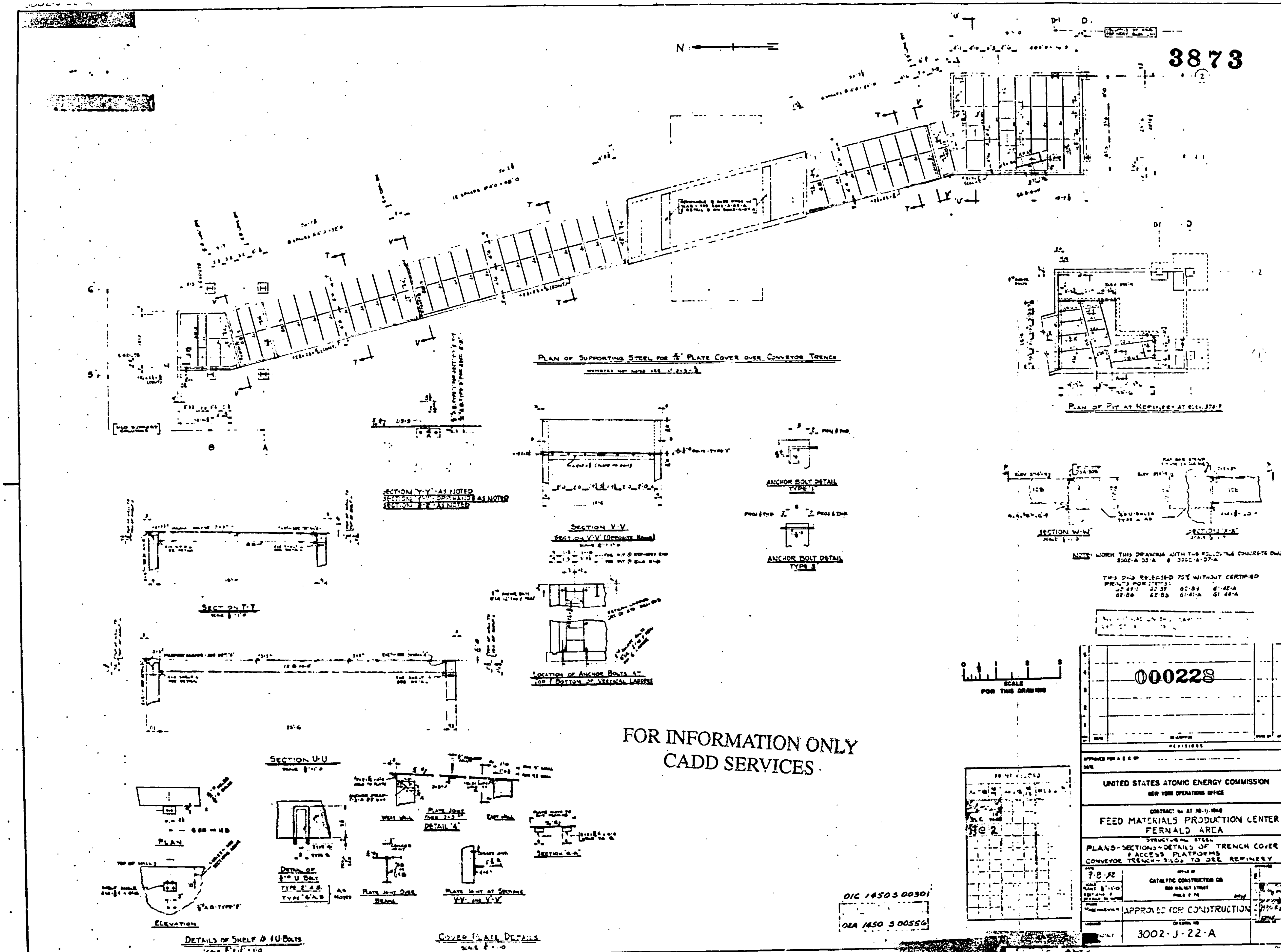
METAL DISSOLVER BLDG. PLANT NO. 2 PLANS & ELEVATIONS

A&CH. DWG.

APPROVED	DATE
GEO.	
H.L.CR.	
A.E.C.	

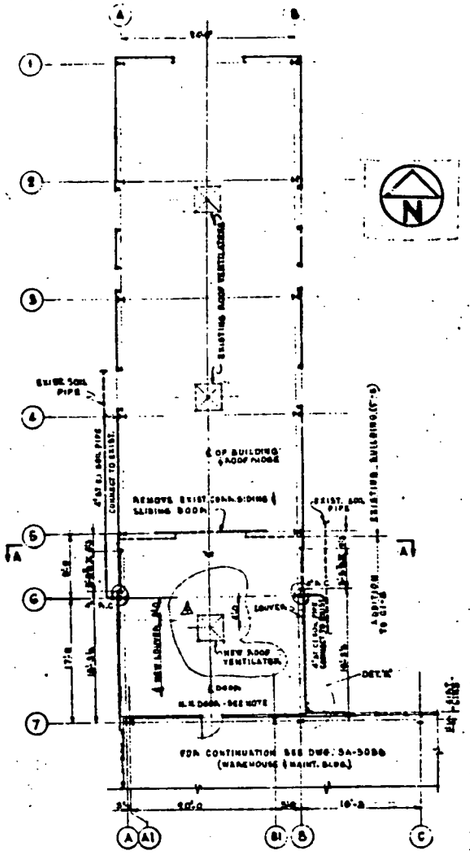
5250-2A-5043 10

DRAWING NO.	REV.
5250-2A-5043	10

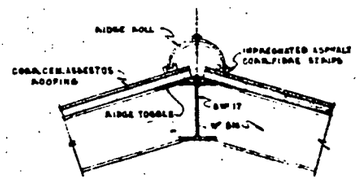


3873
N
PLAN OF SUPPORTING STEEL FOR ¼" PLATE COVER OVER CONVEYOR TRENCH
PLAN OF PIT AT REFINERY
SECTION V-V
ANCHOR BOLT DETAIL TYPE 1
ANCHOR BOLT DETAIL TYPE 2
SECTION T-T
SECTION W-W
SECTION X-X
LOCATION OF ANCHOR BOLTS AT TOP & BOTTOM OF VERTICAL LADDERS
SCALE FOR THIS DRAWING
000228
SECTION U-U
PLAN
ELEVATION
DETAILS OF SHELF & U-BOLTS
COVER PLATE DETAILS
DETAIL "A"
FOR INFORMATION ONLY
CADD SERVICES
01C 1450 S 00301
02A 1450 S 00556
REVISIONS
UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE
FEED MATERIALS PRODUCTION CENTER
FERNALD AREA
STRUCTURAL STEEL
PLANS - SECTIONS - DETAILS OF TRENCH COVER & ACCESS PLATFORMS
CONVEYOR TRENCH - SILOS TO ORE REFINERY
7-8-52
CATALYTIC CONSTRUCTION CO
APPROVED FOR CONSTRUCTION
3002-J-22-A
JAN 0 9 2001

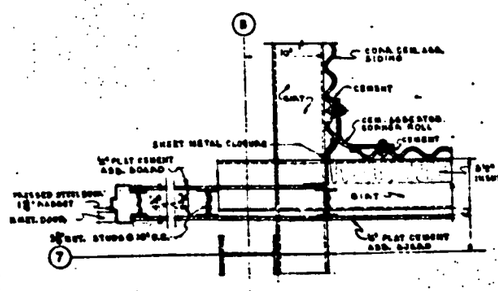
3873



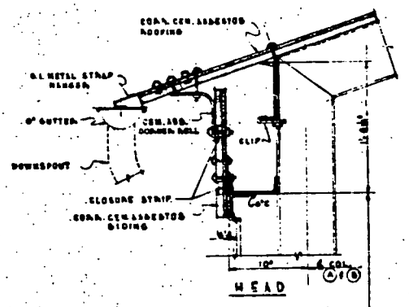
PLAN



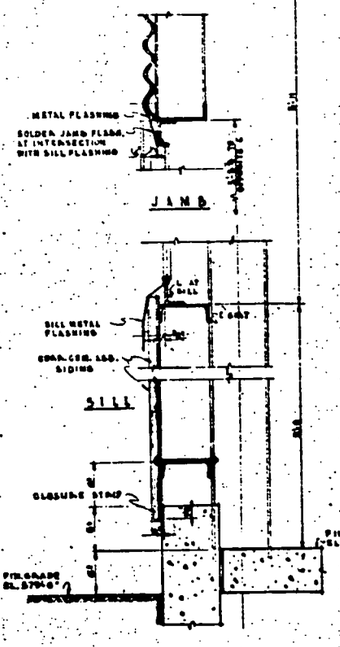
DETAIL OF RIDGE ROLL



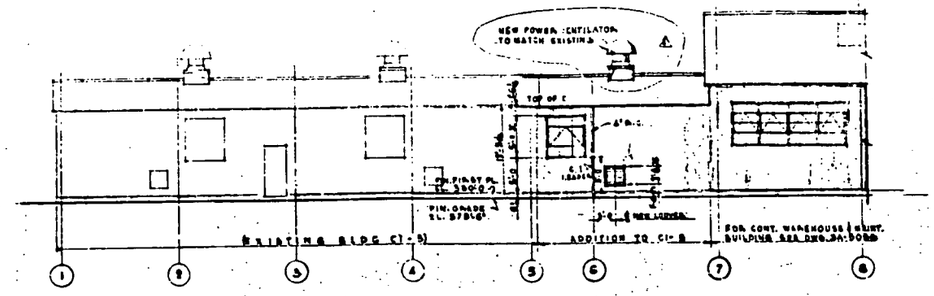
DETAIL 'A'



HEAD



TYPICAL WALL SECTION AT WINDOW



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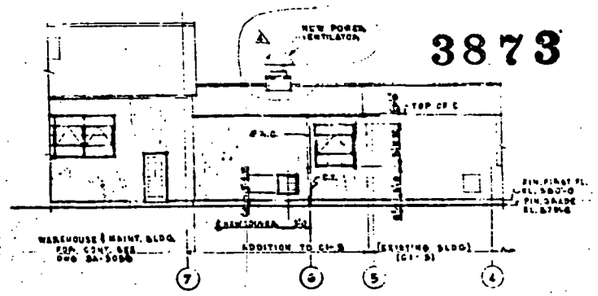

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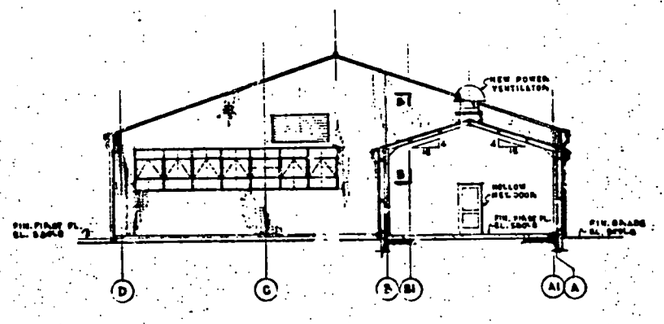
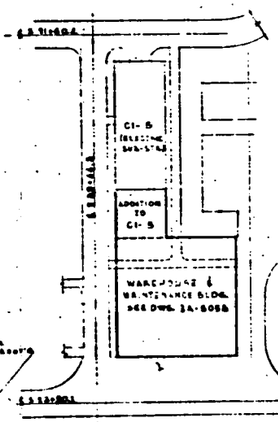


SECTION A-A

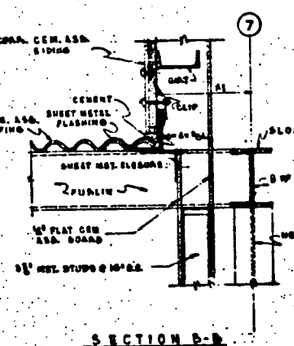
WINDOW SCHEDULE		
UNIT SASH SIZE		No
5'-6" × 5'-6"		7

NOTE

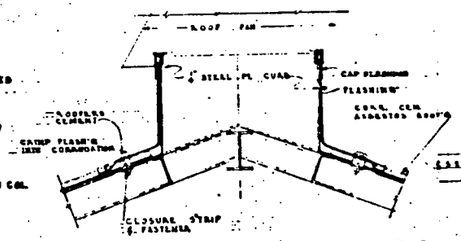
HOLLOW METAL DOOR SHALL BE 3'-0" × 7'-0" × 1 3/4" THICK
PROVIDE FOLLOWING HARDWARE: FOR PR. BUTT HINGES
1 DOOR CLOSER
1 EXIT BOLT



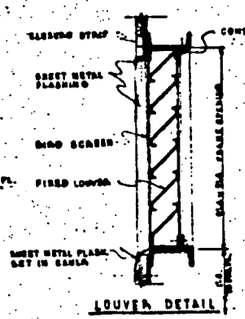
SITE PLAN
SCALE 1"=30'



SECTION B-B



FLASHING DETAIL AT POWER VENT



LOUVER DETAIL

NOTE: ALL SHEET METAL FLASHING TO BE ALUMINUM

SCALE FOR THIS DRAWING

REVISIONS	DATE	BY	CHK.
4 RELOCATED NEW POWER VENTILATOR			
3 ADDED ROOF VENT DET. & NOTE			
2 REVISED SUCA DETAIL			
1 ISSUED FOR CONSTRUCTION			

DRAWN	R.E.	
TRACED	A.D.	J.B.C.
DESIGNED	W.P.	J.R.C.
CHECKED	C.K.	A.B.
APPROVED		
U.S. AEC		
SUBMITTED	W. PINTEL	
DATE	7-22-58	
SCALE	1/8"=1'-0"	

REFERENCE DRAWINGS	NO.
SITE REP. WAREHOUSE & MAINT. BLDG.	SA-5088
EL. SUBSTATION BLDG. EXT.	SA-5078
HEATING & VENTILATING	SA-5081
BILL OF MATERIAL REF.	
SPECIFICATION REF.	

U. S. ATOMIC ENERGY COMMISSION

SINGMASTER & BREYER

NATIONAL LEAD COMPANY OF OHIO

ELECTRIC SUBSTATION SLDG EXTENSION

PLANS, ELEVATIONS & DETAILS

SA-5121 4

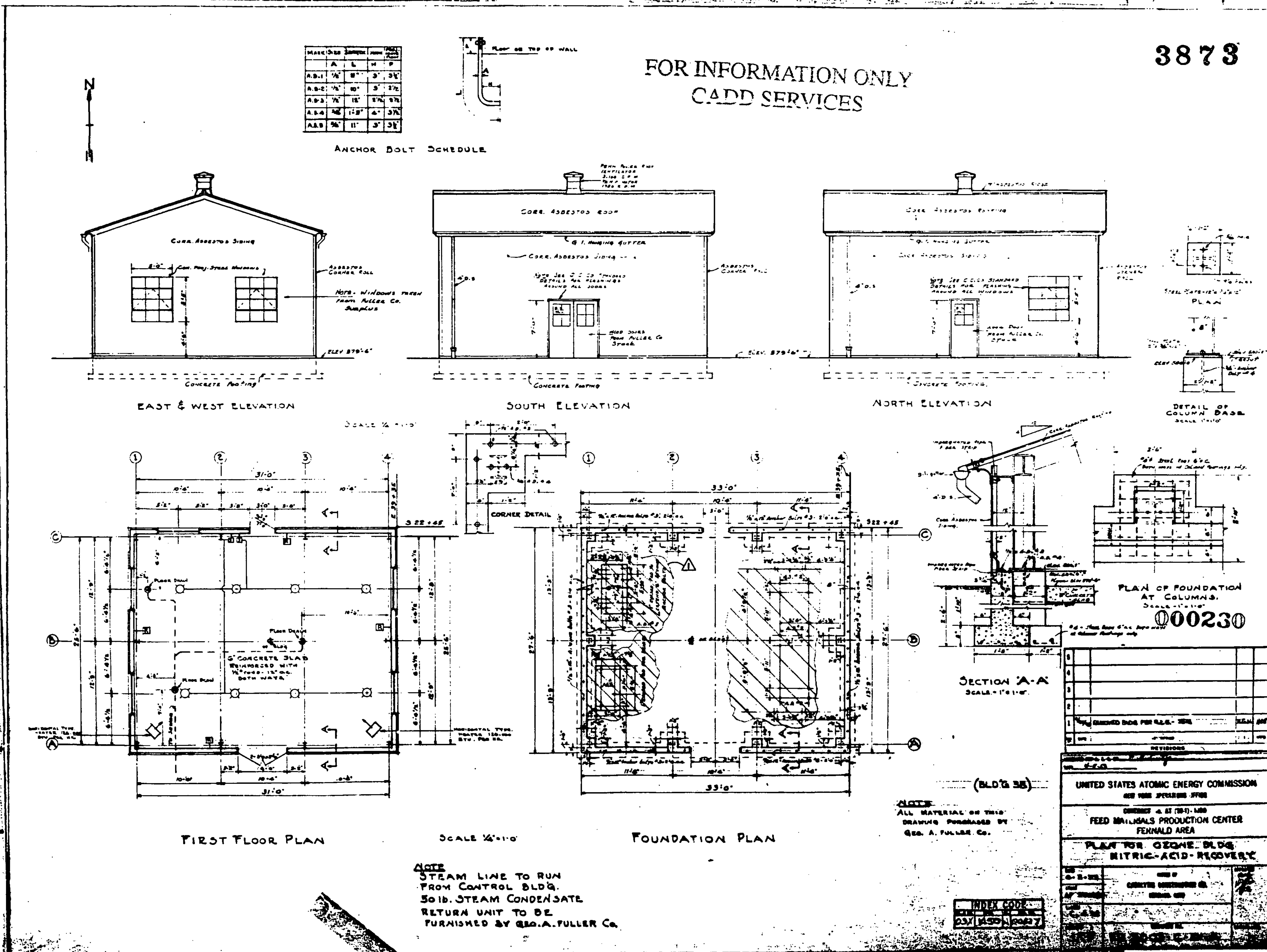
000229

INDEX CODE

PLANT NO.	CHAN.	CL.	MAJ. NO.
0331	7000	A	10150

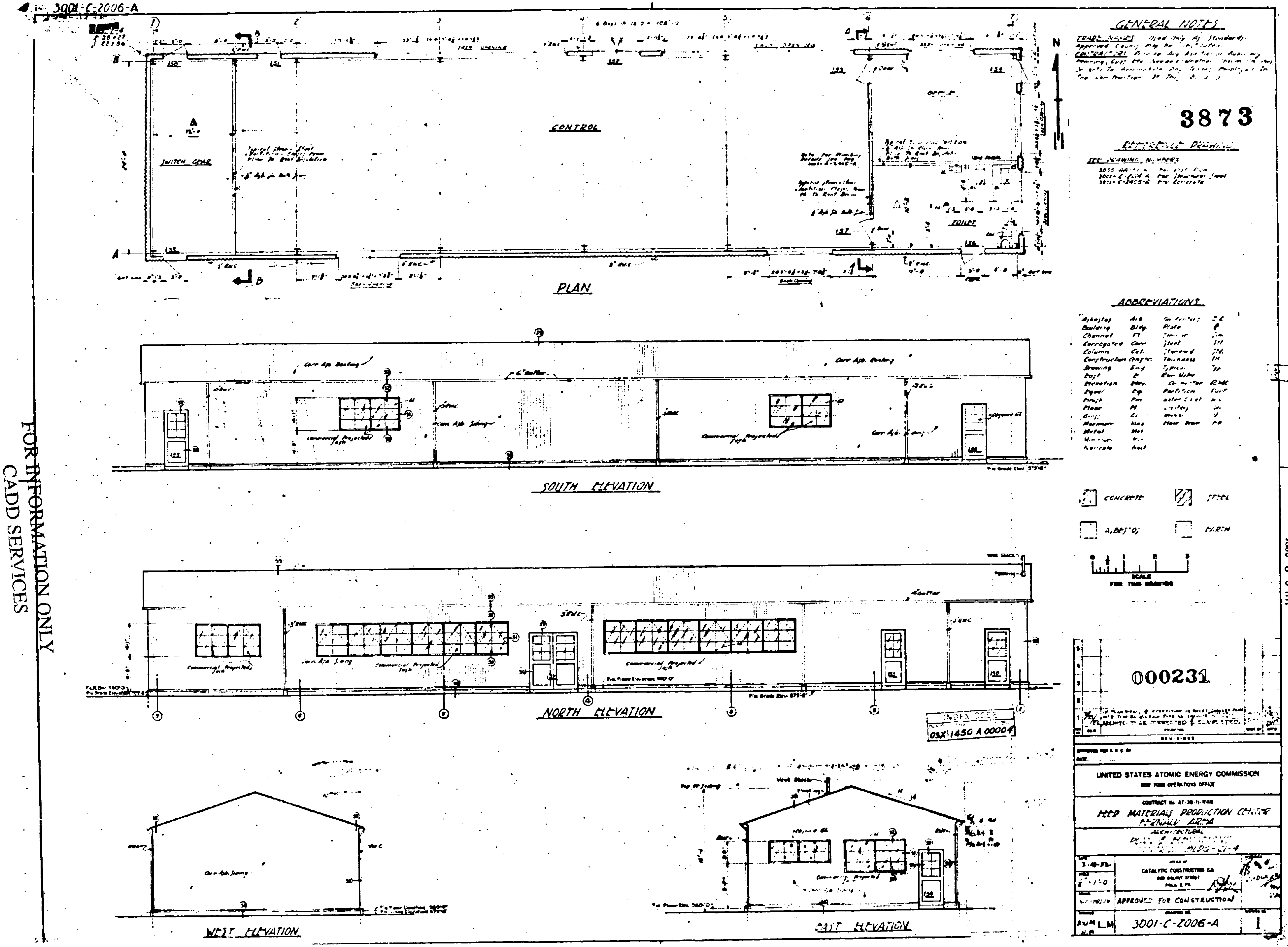
JAN 09 2007

FOR INFORMATION ONLY
CADD SERVICES



3873
FOR INFORMATION ONLY
CADD SERVICES
N
ANCHOR BOLT SCHEDULE
EAST & WEST ELEVATION
SOUTH ELEVATION
NORTH ELEVATION
DETAIL OF COLUMN BASE
CORNER DETAIL
FIRST FLOOR PLAN
SCALE ¼"=1'-0"
FOUNDATION PLAN
SECTION "A-A"
PLAN OF FOUNDATION AT COLUMNS.
000230
(BLD'G 38)
NOTE
ALL MATERIAL ON THIS DRAWING FURNISHED BY GEO. A. FULLER CO.
NOTE
STEAM LINE TO RUN FROM CONTROL BLD'G.
50 lb. STEAM CONDENSATE RETURN UNIT TO BE FURNISHED BY GEO. A. FULLER Co.
INDEX CODE
03Y 1450 20627
REVISIONS
UNITED STATES ATOMIC ENERGY COMMISSION
FEED MATERIALS PRODUCTION CENTER
FERNALD AREA
PLAN FOR OZONE BLDG.
NITRIC-ACID-RECOVERY

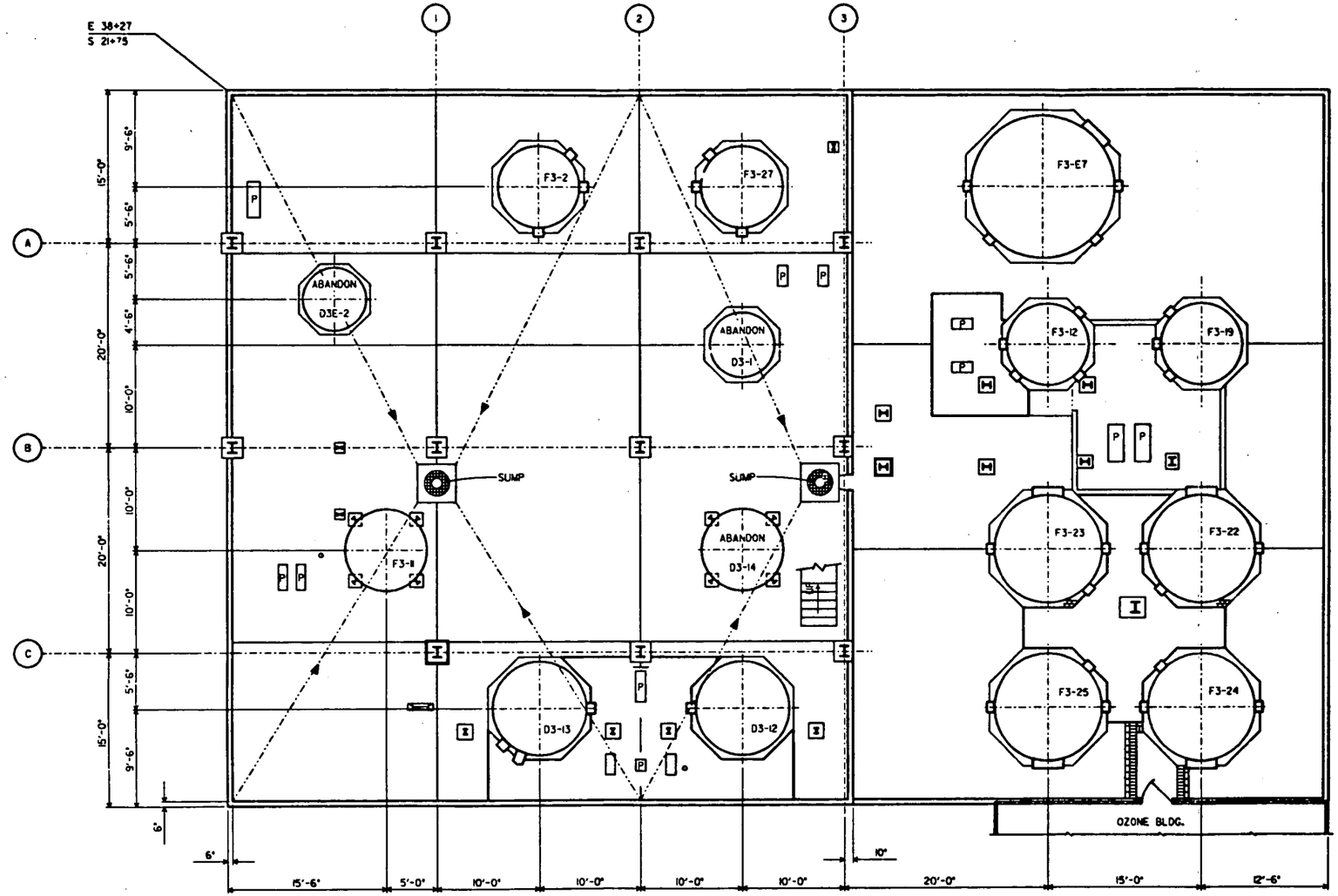
JAN 0 9 2001



FOR INFORMATION ONLY
CADD SERVICES

JAN 0 9 2001

3873



PLAN
ELEV.- 580'-6"

000232

FOR INFORMATION ONLY
CADD SERVICES

NO.	REVISIONS	DATE	DWN. BY	APPD.
1	UPDATED	2-5-96	MET	GEP

NO.	REVISIONS	DATE	DWN. BY	APPD.

REF. DWG. NO.
03X-1450-S-00003
03X-7000-S-00207
03X-1450-S-00100
03X-1450-S-00099
03X-1450-S-00098

NOTE: WEMCO C.A.D. DRAWING NOT TO BE REVISED MANUALLY

APPROVALS			
CIVIL & STR.		SAFETY ENG.	
ELECTRICAL		MAINTENANCE	
ENGINEER		Q.A.	
INSTRUMENT			
MECHANICAL		FIRE PROTECT.	
		WASTE MANAGE.	
CHECKED	GEP	O.O.M.	
APPROVED	G. E. PAUL	SECURITY	

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT CO. OF OHIO
FERNALD, OHIO
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
U.S. DEPARTMENT OF ENERGY

BUILDING 30 FIRST FLOOR
NITRIC ACID RECOVERY
FLOOR PLAN
3/16" = 1'-0"
RES. ISS. 03X-5500-A-01027 | 1
DRAWN C.V.

DO NOT SCALE REDUCED DRAWINGS

FILE NAME: /FLOOR/30LDGN

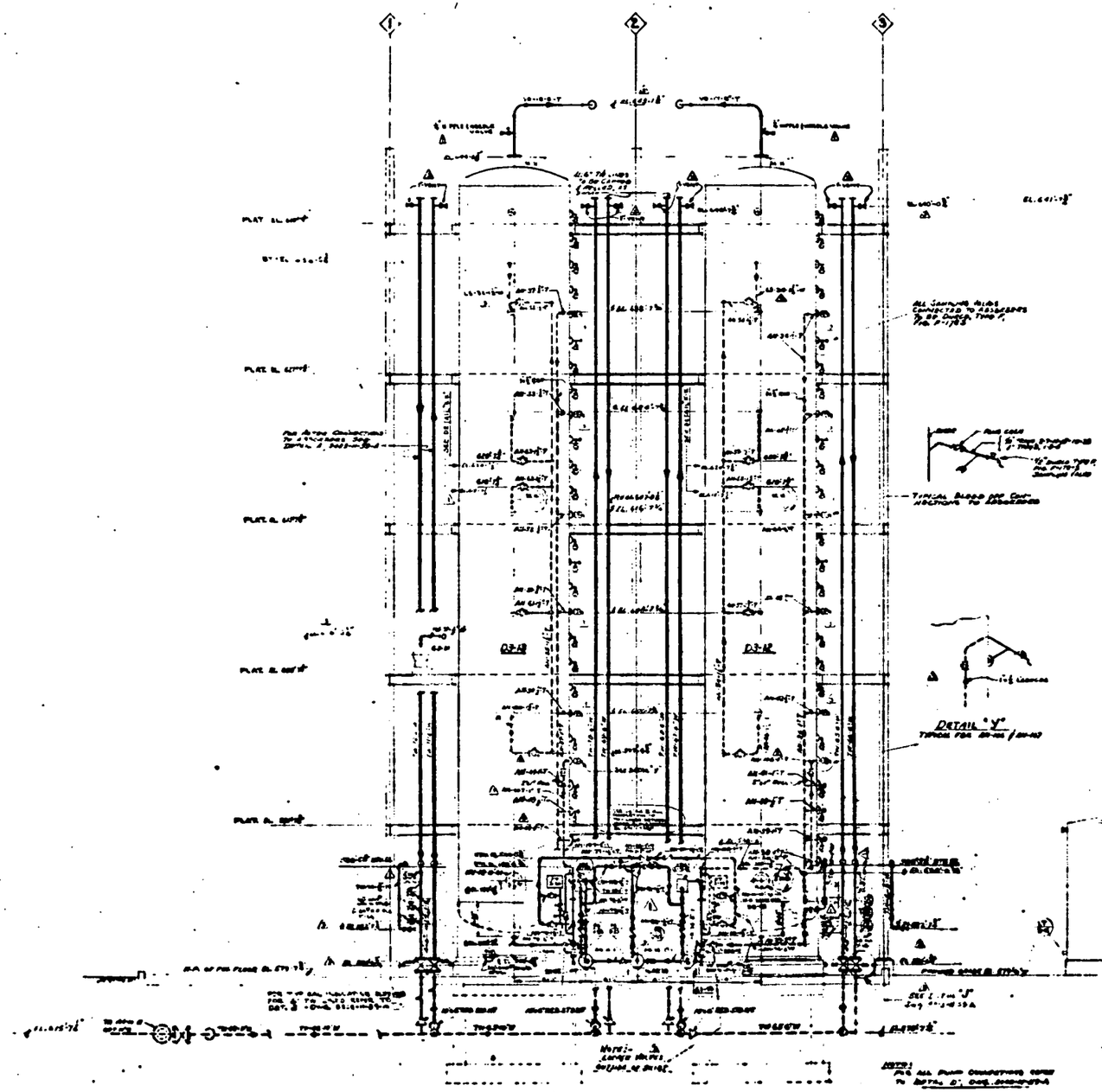
R3d1.m(2054.ws10) joe@ws10. Fri Sep 29 09:48:30 EDT 1995

3003-H-53-A

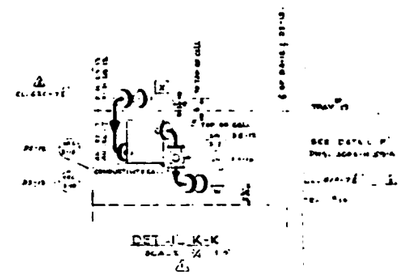
REFERENCE DRAWINGS

FOR LIST OF REFERENCE DRAWINGS AND SYMBOLS, SEE DRAWING NUMBER 3003-H-53-A

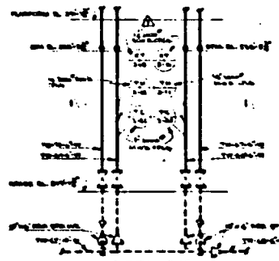
3873



SECTION "A-A"

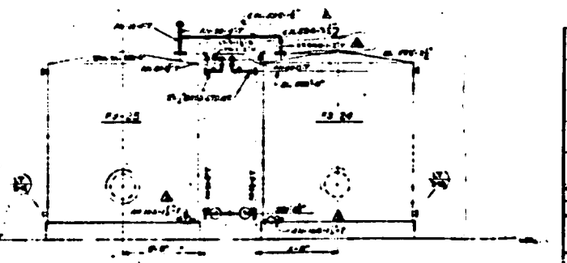


DETAIL "K-K"



DETAIL "Z"
DETAIL SHOWING TW LINES FROM GRADE TO PLATFORM EL 511'-3"

DETAIL "Y"



SCALE FOR THIS DRAWING 000233

REVISIONS	
APPROVED FOR A.E.C. BY	
DATE	

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

CONTRACT No. AT(30-1)-1040

FEED MATERIALS PRODUCTION CENTER
FERNALD AREA

SECTION A-A
NITRIC ACID RECOVERY

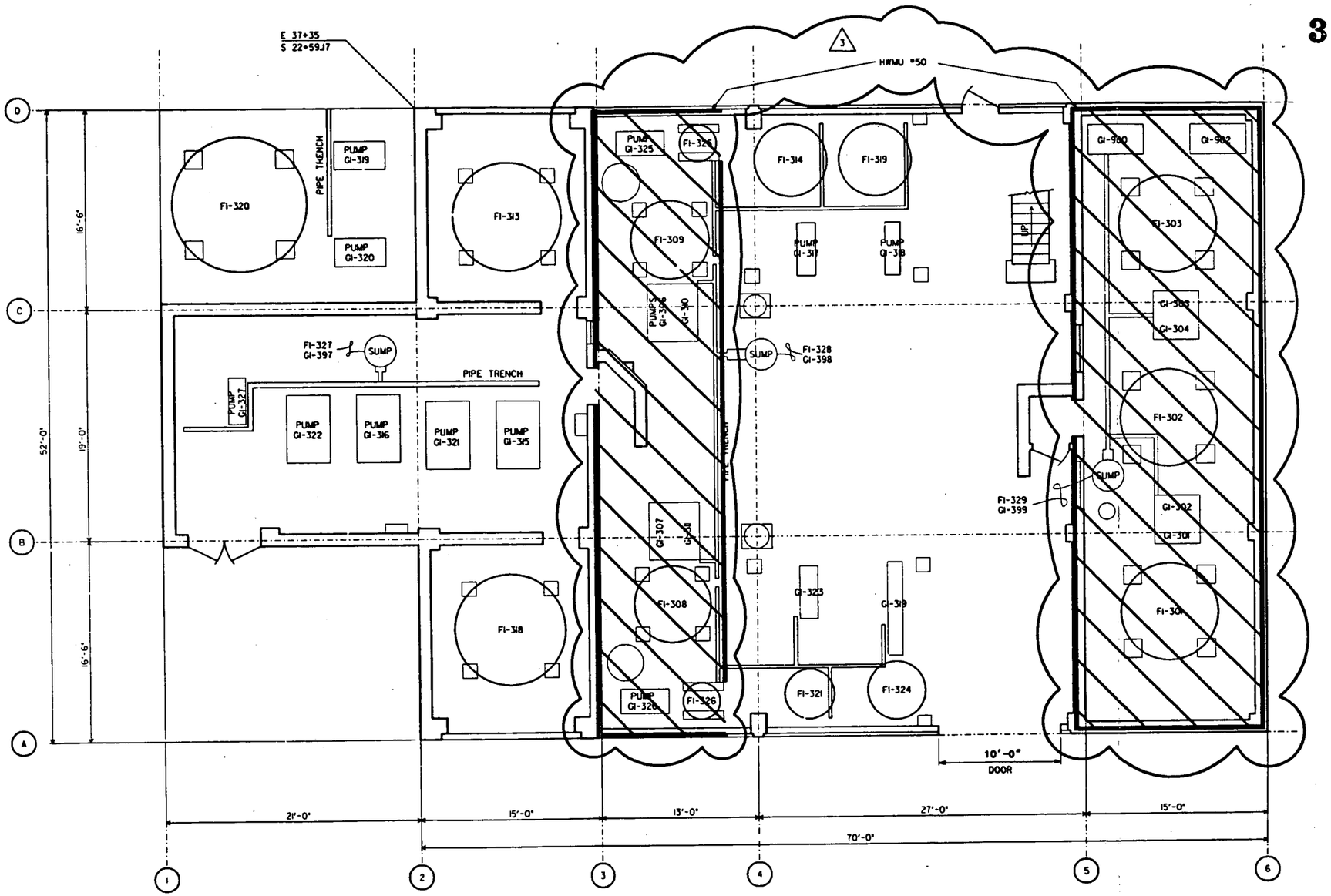
DATE 5-15-56	OFFICE OF CATALYTIC CONSTRUCTION CO. 1500 WALNUT STREET PHILA. 2, PA.	REVISIONS
SCALE 1/8"-1'-0"		
DESIGNED A. KUSHNER	APPROVED FOR CONSTRUCTION	
DRAWN A. PEREA	DRAWING NO. 3003-H-53-A	SHEET NO. 4

INDEX CODE
03X.1450.P00297

PRINT RECORD

3873

FOR INFORMATION ONLY
CADD SERVICES



PLAN AT ELEVATION 580'-0"

NOTE:
1. WORK THIS DRAWING WITH SAFE-SHUTDOWN DRAWING: se3e1.dgn.
2. REMOVED EQUIPMENT ON LEVEL 35.

NO.	REVISIONS	DATE	DWN. BY	APPD.
3	REV PER RES 3516	4/27/98	MKF	GEP
2	ADDED FI-327, 328, & 329 / GI-397, 398, & 399	9-16-97	JMP	GEP
1	UPDATED	12-6-96	MET	GEP

NO.	REVISIONS	DATE	DWN. BY	APPD.	REF. DWG. NO.
					02XA03552.DGN
					02XA03551.DGN
					02X-1450-S-00058

NOTE: WEMCO C.A.D. DRAWING NOT TO BE REVISED MANUALLY

APPROVALS			
CIVIL & STR.			SAFETY ENG.
ELECTRICAL			MAINTENANCE
ENGINEER			Q.A.
INSTRUMENT			
MECHANICAL			FIRE PROTECT.
			WASTE MANAGE.
CHECKED	GEP		D.O.E.
APPROVED	G. E. PAUL	5-28-98	SECURITY

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT CO. OF OHIO
FERNALD, OHIO
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
U.S. DEPARTMENT OF ENERGY

BUILDING 3E — FIRST FLOOR
HOT RAFFINATE BUILDING
FLOOR PLAN
1/4" = 1'-0"

RES 141	02X-5500-A-03350	3
DATE		
DRAWN G.V.		

FILE NAME: /FLOOR/3E1.DGN

JAN 09 2001

R3e1.m(25.cadd11) from7452@cadd11. Mon Apr 27 16:56:33 EDT 1998

000234

3001-C-2013-A

DOOR SCHEDULE

OPNG. NO.	TYPE	SIZE		THK.	MAT.	THRESHOLD MAT. TYPE	REMARKS
120	C	3'-0"	7'-0"	2¼	WOOD	METAL	SEE MISC. METAL SHEET
121	D	10'-0"	7'-0"	—	STEEL	—	
122	B	3'-0"	7'-0"	2¼	WOOD	METAL	SEE REMARKS FOR DET. NO.
123	A	3'-0"	7'-0"	1¾	20	—	
124	A	3'-0"	7'-0"	1¾	20	—	
125	A	3'-0"	7'-0"	1¾	20	—	
126	B	3'-0"	7'-0"	2¼	20	METAL	SEE SIMILAR FOR DET. NO.
127	A	3'-0"	7'-0"	1¾	20	—	

DOOR TYPES

3873

SECTION A-A

EAST ELEVATION - COLUMN LINE 4

SECTION B-B

EAST ELEVATION - COLUMN LINE 4-X

FIRST FLOOR ELEV. 380'-0

DETAIL - CONNECTION OF TROLLEY BEAM TO RAFTERS OF HOIST-UP TANK ROOM ROOF

EAST ELEVATION - COLUMN LINE 5

NORTH ELEVATION AT COLUMN LINE 'D'

EAST ELEVATION - COLUMN LINE 6

NOTE: ALL DETAILS MARKED ○ REFER TO DWG. 3000-C-1001-A

FOR GENERAL NOTES & REFERENCE DWGS. SEE 3000-C-2001-A

DO NOT SCALE REDUCED DRAWINGS

INDEX CODE
02X 1450 S 00054

INDEX CODE
02X 1450 A 00055

UNITED STATES ATOMIC ENERGY COMMISSION

CONTRACT No. AT(38-1)-958

FEED MATERIALS PRODUCTION CENTER
FERNALD AREA

ELEVATIONS
NOT. RAFFINATE - BUILDING C-1-6

CAM APPROVED FOR CONSTRUCTION

3001-C-2013-A 2

000235

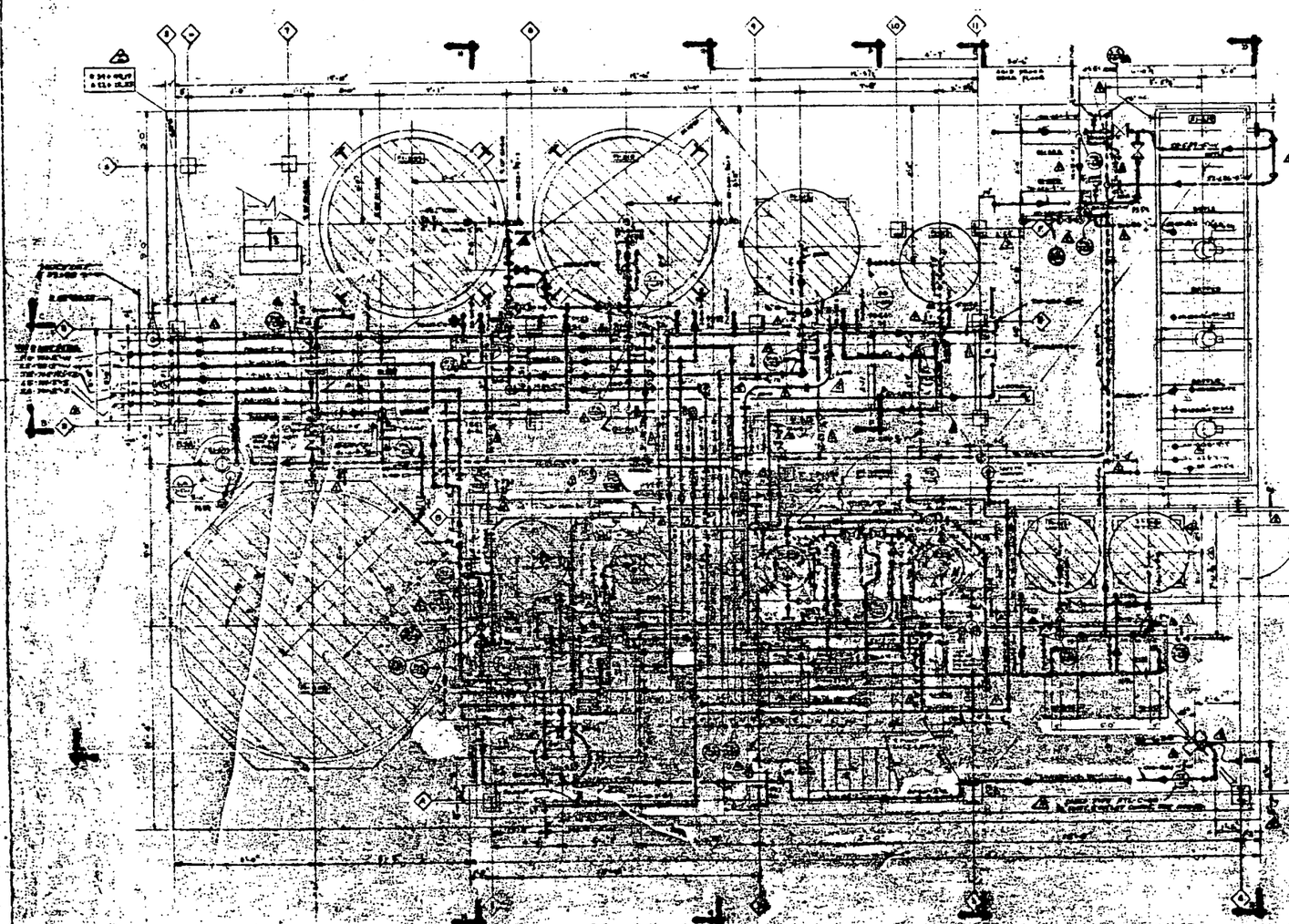
JAN 09 2001

FOR INFORMATION ONLY
CADD SERVICES

3001-H-182-A

FOR INFORMATION ONLY
CADD SERVICES

N



PLAN FROM 586'-0" TO GRADE

REFERENCE DRAWINGS 3878

1	ENGINEERING FLOW DIAGRAM, C.C.CO.	3001-H-1
2	UTILITIES FLOW DIAGRAM, C.C.CO.	
3	PLOT PLAN C.C.CO.	
4	UNDER GROUND PIPING DWG. C.C.CO.	
5	FOUNDATION PLAN	3001-A-01-A
6	FOUNDATION FOR BUILDING C.C.CO.	3301-S-2408-A
7	STRUCTURAL STEEL FOR 11'-0" PLATFORM C.C.CO.	3001-S-01-A
8	STRUCTURAL STEEL FOR BLDG. PLATFORM	
9	TYPICAL STEAM TRAP PIPING PLATFORM	DSM
10	INSTRUMENT PIPING DWG. PLATFORM	
11	REFINERY SUMP DETAILS C.C.CO.	3001-H-121-A
12	PLAN VIEW AT EL. 586'-0" C.C.CO.	3001-H-122-A
13	SECTIONS A-A & B-B C.C.CO.	3001-H-124-A
14	SECTIONS C-C & D-D C.C.CO.	3001-H-125-A
15	SECTIONS E-E & F-F C.C.CO.	3001-H-126-A
16	SECTIONS G-G & H-H C.C.CO.	3001-H-127-A

GENERAL NOTES

1. ALL ELEVATIONS ARE BASED ON TRUE ELEVATIONS
2. ALL FLANGES, VALVES AND FITTINGS SHALL CONFORM TO LINE SPECIFICATIONS UNLESS OTHERWISE NOTED
3. ALL PUMPS AND CENTRIFUGAL COMPRESSOR S AND TURBINE INLETS SHALL BE PROVIDED WITH A TEMPORARY STRAINER
4. ALL VENT AND DRAIN CONNECTIONS TO BE ¾" UNLESS OTHERWISE NOTED
5. ALL THERMOWELL CONNECTIONS TO BE 1" COUPLINGS
6. ALL PRESSURE INSTRUMENT CONNECTIONS TO BE ½" COUPLINGS UNLESS OTHERWISE NOTED
7. UNINSULATED LINES ARE PLACED DIRECTLY UPON PIPE SUPPORT BEAMS. INSULATED LINES UP TO AND INCLUDING 10" ARE SUPPORTED ON 4" SHOES INSULATED LINES 12" AND LARGER ARE ON 6" SHOES.
8. ALL FLANGED "E" SPEC. ELBOWS ARE LONG RADIUS UNLESS OTHERWISE NOTED.
9. ALL BENDS TO BE 5 DIAMETER RADIUS.
10. IT IS PERMISSABLE TO BOLT FLAT FACE & RAISED FACE FLANGES TOGETHER.

PRINT RECORD

INDEX CODE
026 1450 P00186

REVISIONS

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

FEED MATERIALS PRODUCTION CENTER
FERNALD, AREA

EQUIPMENT & PIPING
PLAN AT EL. 586'-0"
ORE REFINERY - REFINERY JUMP

APPROVED FOR CONSTRUCTION

3001-H-182-A

000236

JAN 0 9 2001

3878

SECT. 62

STORAGE BIN

SOUTH ELEVATION

EAST ELEVATION

NORTH ELEVATION

WEST ELEVATION

SECT. 51

SECT. 57

SECT. 52

SECT. 53

SECT. 58

SECT. 59

SECT. 60

TYPICAL CURB DETAIL
SECT. 61

REFERENCE DRAWS.

NOTE

ABBREVIATIONS

PLAN AT OPERATING LEVEL

PLAN AT TOP OF STORAGE BIN

PLAN AT N.E. CORNER OF TOWER, AT ELEV. 627'-0"

SECT. 55 THRU GUSSET ALONG EAST-WEST CENTER LINE

SECT. 54 THRU GUSSET ALONG COL. LINE B

SECOND FLOOR PLAN

FIRST FLOOR PLAN

SECT. 56
TYPICAL EAVE SECTION AT MAIN ROOF

INDEX CODE
08X1430A00011

000237

PRINT RECORD

ALL MATERIAL ON THIS DRAWING PURCHASED BY GEORGE A. FULLER CO.

UNITED STATES ATOMIC ENERGY COMMISSION

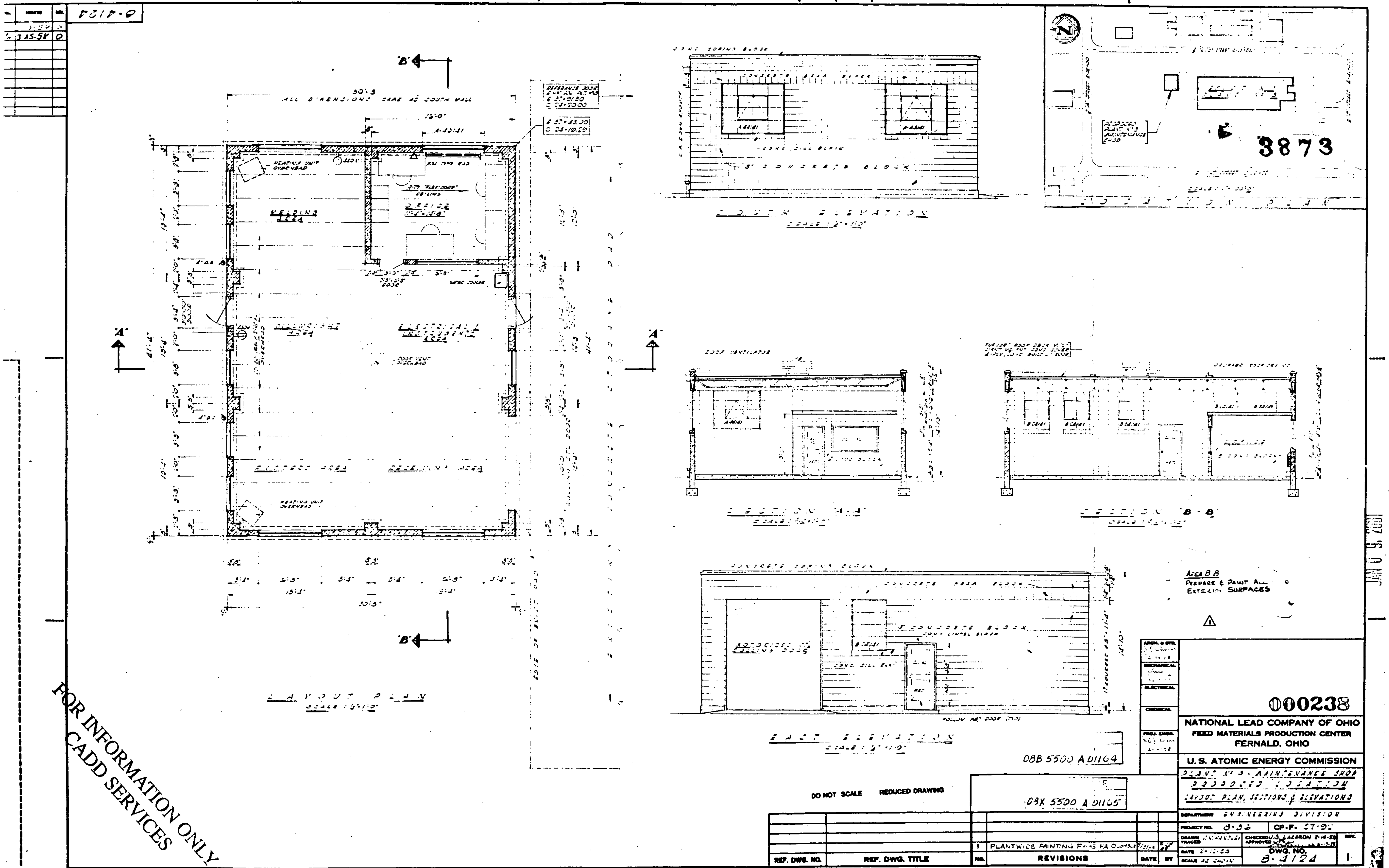
FEED MATERIALS PRODUCTION CENTER
FERNALD AREA

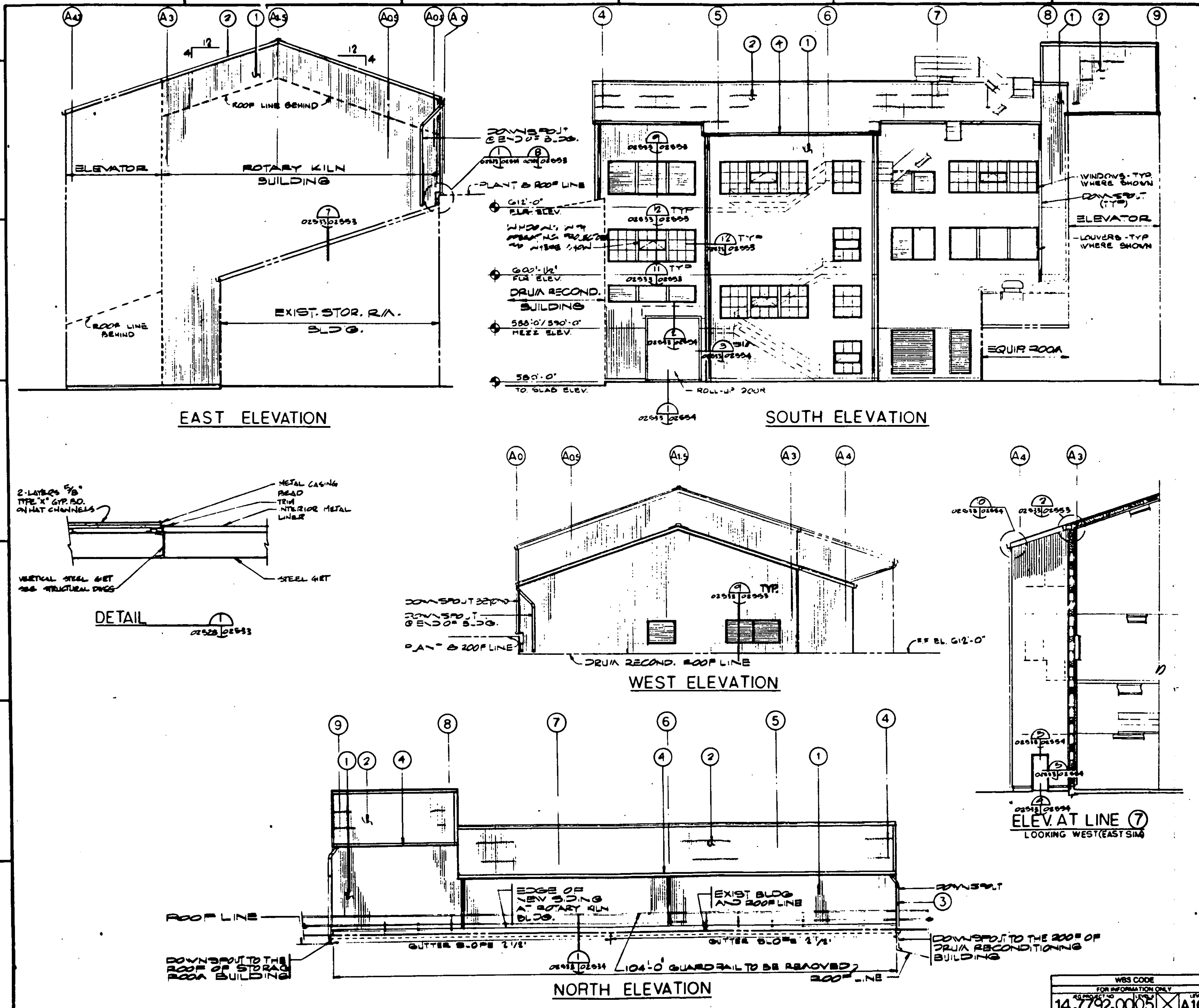
ARCHITECTURAL
PLANS AND ELEVATIONS
SCRAP PLANT 43 C

9-22-52

APPROVED
CONSTRUCTION

E.W. 3043-C-1001-A 1





REFERENCE DRAWING	
DRAWING NO.	TITLE
A-02528	FLOOR PLAN EL. 580'-0"
A-02529	" " " 588'-0"
A-02530	" " " 600'-0"
A-02531	" " " 612'-0"
A-02532	ROOF PLAN
A-02534	SECTIONS & DETAILS
A-02553	MISCELLANEOUS " SHT. 1
A-02554	" " " 2

3873

MATERIAL CALL-OUT

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]

DO NOT SCALE REDUCED DRAWING

REV NO	ISSUE OR REVISION PURPOSE DESCRIPTION	A-E	OPER	DOE
0	CERTIFIED FOR CONSTRUCTION	11-5-87		

UNITED STATES
DEPARTMENT OF ENERGY

JACOBS ENGINEERING GROUP INC.
PASADENA, CALIFORNIA

CONTRACT NO DE AC05 85OR21462 A-E NO 3900

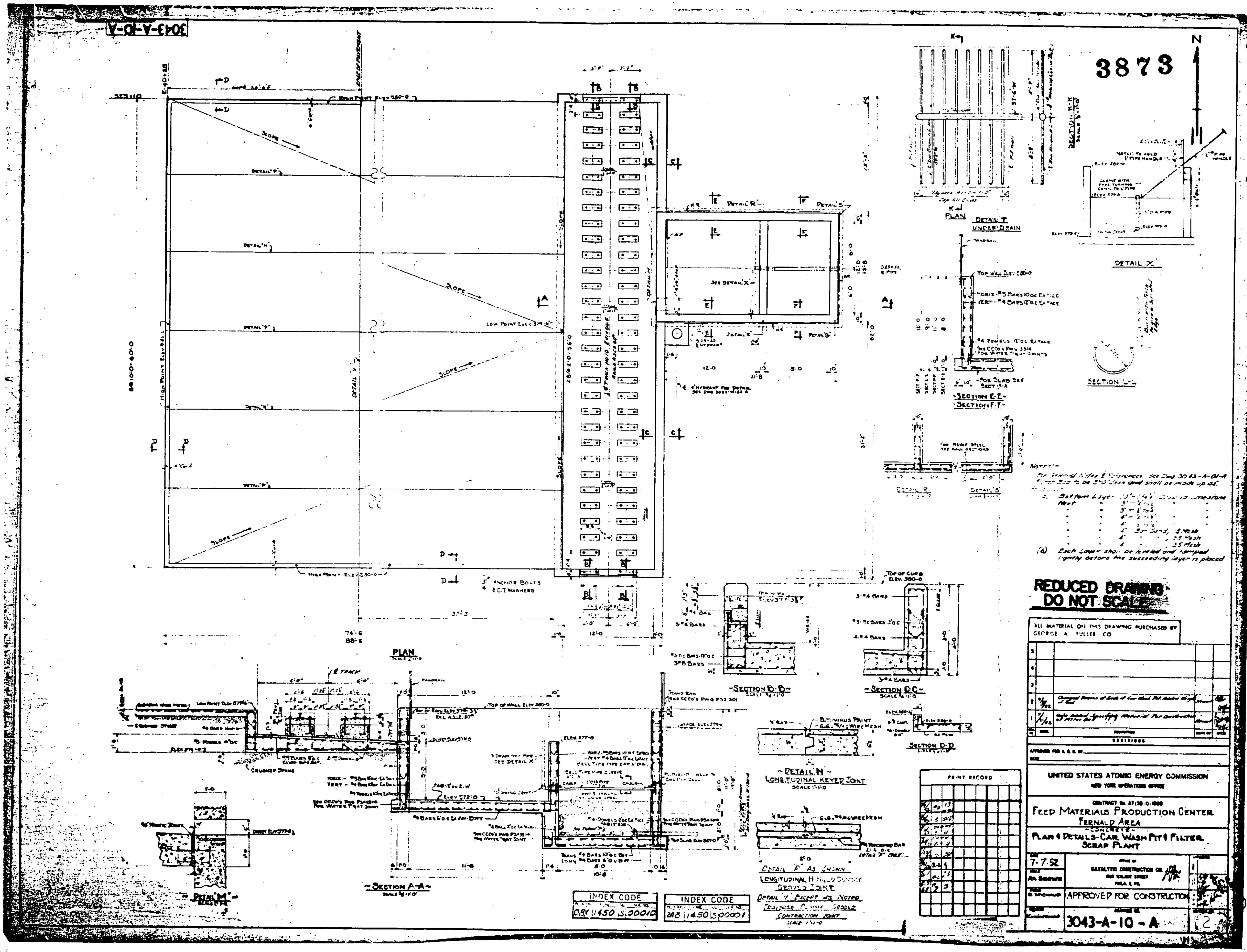
PROJECT NAME
PRODUCTIVITY & RADIOLOGICAL IMPROVEMENTS

DRAWING TITLE
ROTARY KILN ARCHITECTURAL
EXTERIOR ELEVATIONS

PLANT FMPC · BLDG 8 · SCALE 1/8"=1'-0"

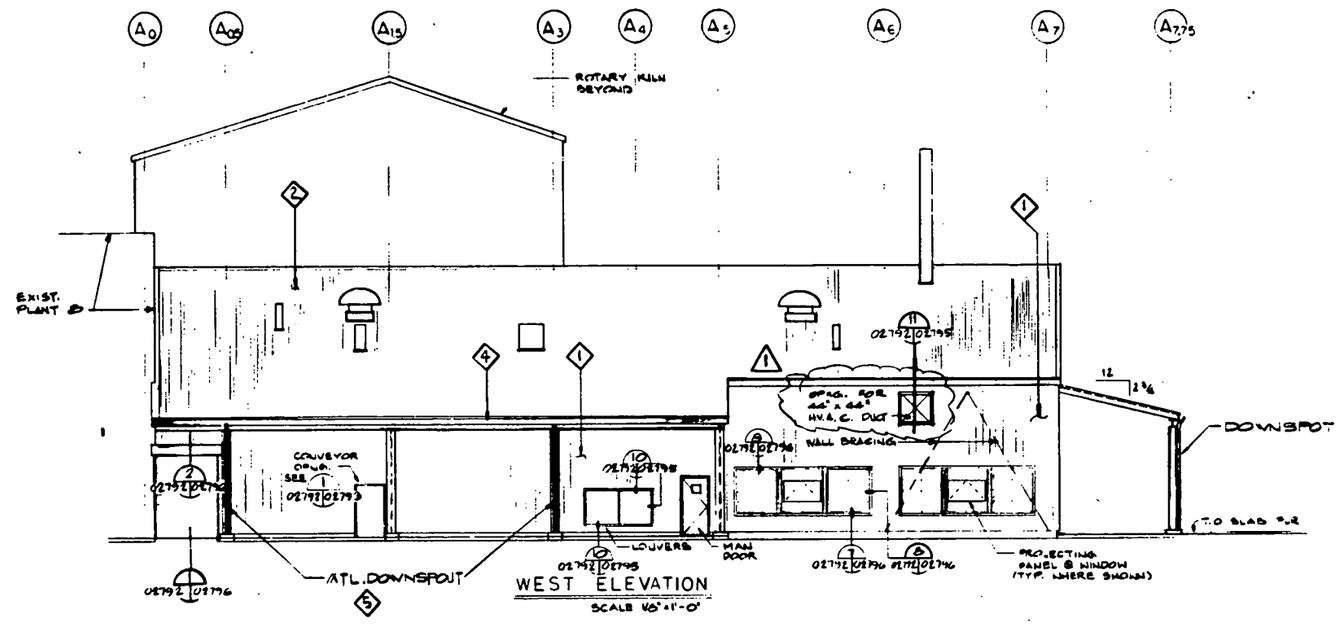
WBS CODE: FOR INFORMATION ONLY
14-7792-0005 | A106

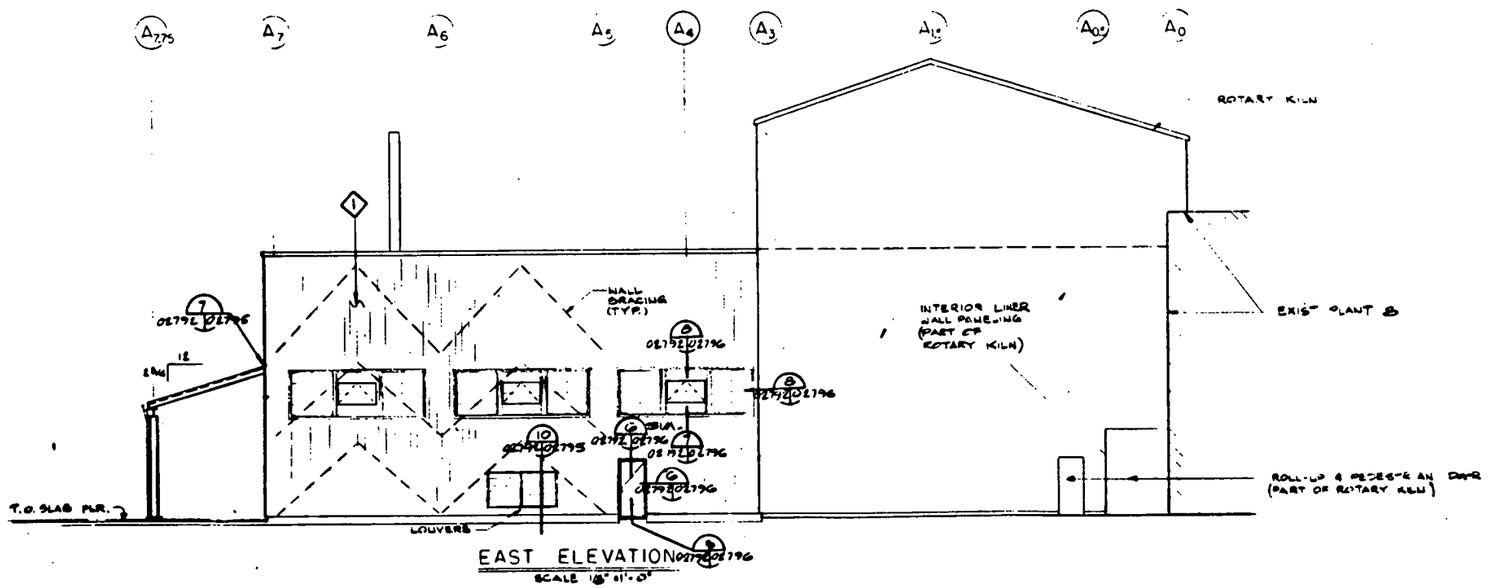
PROJECT NO 85-D-140 · DRAWING NUMBER 08F 3900 A 02533 · REV NO 0



000240

FOR INFORMATION ONLY
CADD SERVICES





REFERENCE DRAWING	
DRAWING NO.	TITLE
A-02791	ROOF PLAN
A-02793	EXTERIOR ELEVATIONS SHEET 2
S-02793	STRUCTURAL ELEVATIONS
S-02792	" "
A-02789	FLOOR PLAN SHEET 1
A-02790	" " " 2
A-02795	MISCELLANEOUS DETAILS
A-02796	" " " "

3873

MATERIAL CALL-OUT

1. PREFINISHED CORR. METAL SIDING
2. PREFINISHED CORR. METAL ROOFING
3. INTERIOR METAL LINER
4. 6" FASCIA TYPE PREFINISHED METAL GUTTER
5. 6"ø PREFINISHED METAL DOWNSPOUT
6. R-19 WALL INSULATION
7. R-22 ROOF/CLG. INSULATION

REV NO	ISSUE OR REVISION PURPOSE DESCRIPTION	A-E INITIALS AND DATE	OPER	DOE
1	H.V.A.C. DUCT OPENING			
0	CERTIFIED FOR CONSTRUCTION			

JAN 09 2004

UNITED STATES DEPARTMENT OF ENERGY

JACOBS ENGINEERING GROUP INC.
PASADENA, CALIFORNIA

CONTRACT NO. N-77208 A-E NO 3900

PROJECT NAME: PRODUCTIVITY & RADIOLOGICAL IMPROVEMENTS

DRAWING TITLE:
DRUM RECONDITIONING
EXTERIOR ELEVATIONS - SHEET 1

DRAWN BY	DATE	DESIGNED BY	DATE	CHECKED BY	DATE
J. KARAMAGOPIAN	7-28-87		11-3-87		11-3-87

PLANT	BLDG	FLOOR	SCALE	CLASS
FMPC				

SUBMITTED FOR APPROVAL — APPROVAL RECOMMENDED — DRAWING APPROVED
A-E DATE 11.5.87 — OPER CONTRACTOR DATE — DOE DATE 11/9/87

DO NOT SCALE REDUCED DRAWING

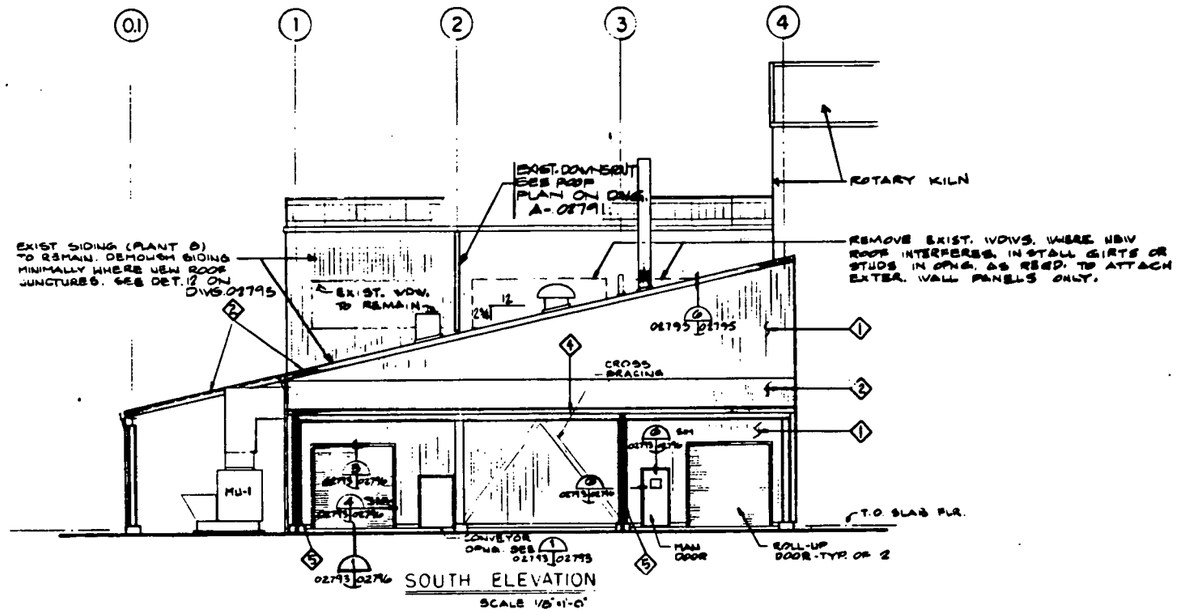
WBS CODE FOR INFORMATION ONLY

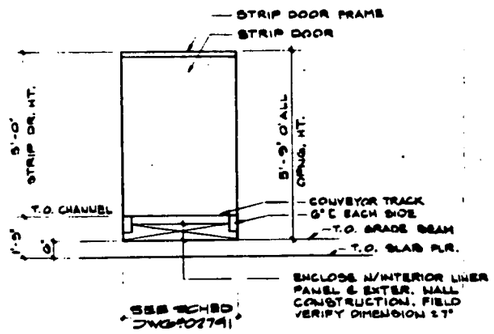
REQ PROJECT NO	LEVEL 2		LEVEL 3
01838700	05	X	A104

PROJECT NO	DRAWING NUMBER			REV NO
85-D-140	08J	3900	A 02792	1

000241

REFERENCE DRAWING	
DRAWING NO.	TITLE
A-02791	ROOF PLAN
A-02792	EXTERIOR ELEVATIONS SHEET 1
A-02793	FLOOR PLAN SHEET 1
A-02794	" " " 2
S-02795	STRUCTURAL ELEVATIONS
S-02796	" "





ELEVATION FROM INTERIOR (1) AT CONVEYOR OPENING 02793 02795

MATERIAL CALL-OUT

1. PRE-FINISHED CORR. METAL SIDING
2. PRE-FINISHED CORR. METAL ROOFING
3. INTERIOR METAL LINER
4. 6" FASCIA TYPE PRE-FINISHED METAL GUTTER
5. 6"ø PRE-FINISHED METAL DOWNSPOUT
6. R-19 WALL INSULATION
7. R-22 ROOF/CLG. INSULATION

3873

FOR INFORMATION ONLY
CADD SERVICES

DO NOT SCALE REDUCED DRAWING

REV NO	ISSUE OR REVISION PURPOSE DESCRIPTION	A-E INITIALS AND DATE	OPER	DOE
0	CERTIFIED FOR CONSTRUCTION			

UNITED STATES
DEPARTMENT OF ENERGY

JACOBS ENGINEERING GROUP INC.
PASADENA, CALIFORNIA

CONTRACT NO N-77208 A-E NO 3900

PROJECT NAME
PRODUCTIVITY & RADIOLOGICAL IMPROVEMENTS

DRAWING TITLE
DRUM RECONDITIONING - ARCH'AL
EXTERIOR ELEVATIONS - SHEET 2

DRAWN BY	DATE	DESIGNED BY	DATE	CHECKED BY	DATE
S. KARANASOPIAN	9-30-93		10-1-93		10-1-93

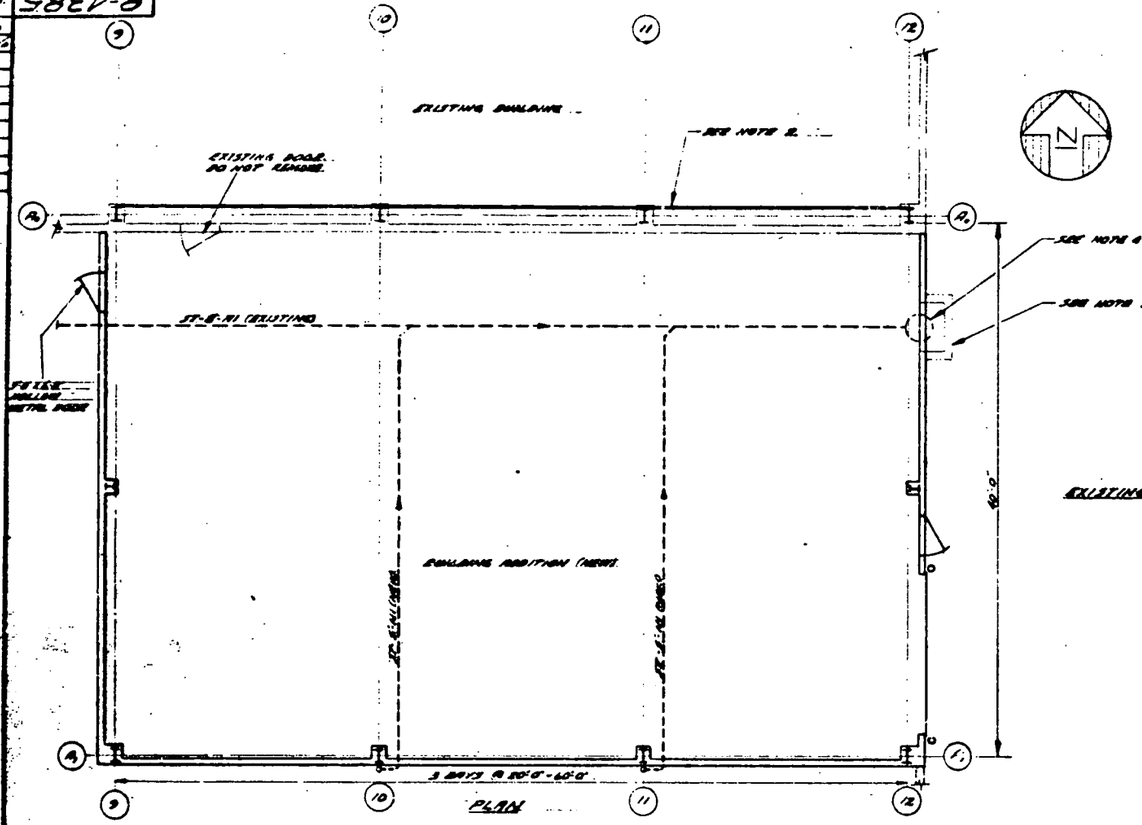
PLANT	BLDG	FLOOR	SCALE	CLASS
FMPC				

SUBMITTED FOR APPROVAL: DATE 10-6-93
APPROVAL RECOMMENDED: OPER CONTRACTOR DATE 10-7-93
DRAWING APPROVED: DOE DATE 10/12/93

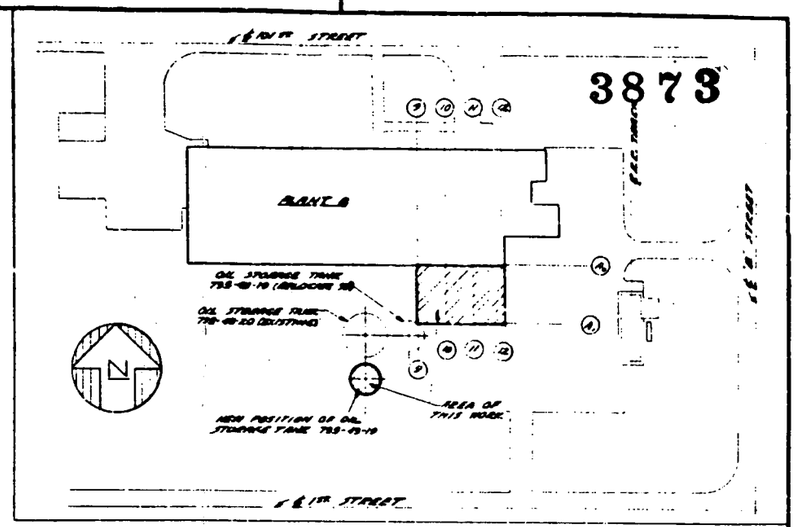
WBS CODE	PROJECT NO	DRAWING NUMBER	REV NO
FOR INFORMATION ONLY			
01-8387-0005 X A105	85-D-140	08J 3900 A 02793	0

000242

8-4385



PLAN

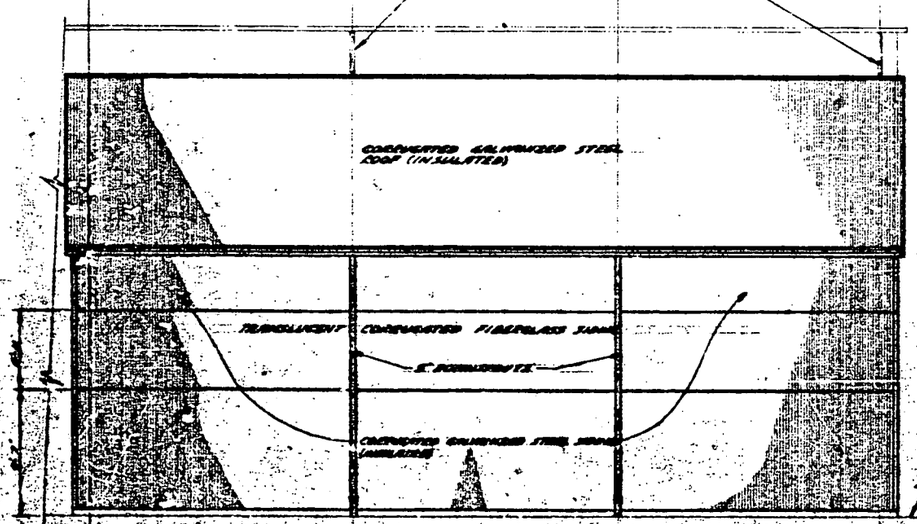


PLOT PLAN
SCALE: 1"=50'-0"

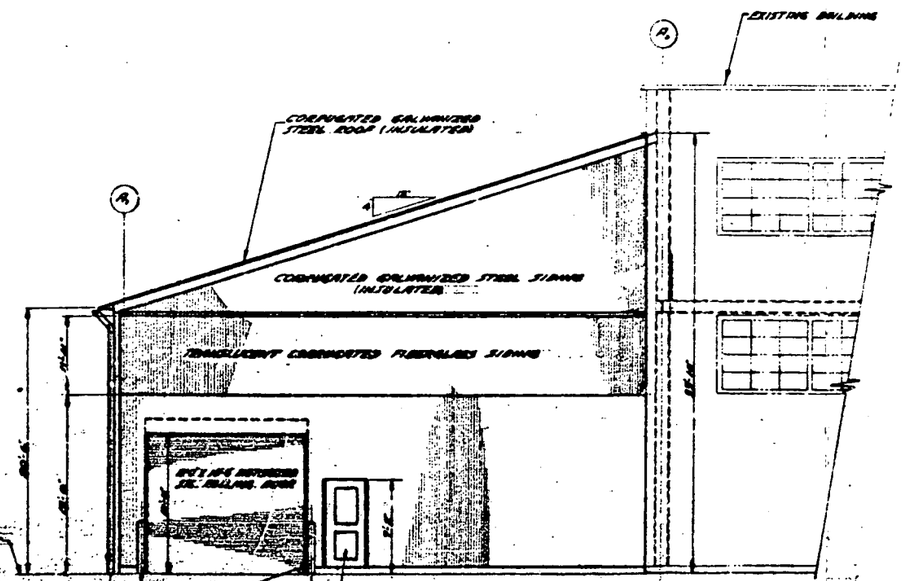
FOR INFORMATION ONLY
CADD SERVICES

GENERAL NOTES

1. BUILDING ADDITION SHALL BE ARMCO 3-SW RIGID FRAME BUILDING WITH CORRUGATED GALVANIZED STEEL SIDING & ROOFING OR APPROVED EQUAL.
2. REMOVE SIDING & GIRTS ON EXISTING BUILDING IN AREA ADJACENT TO BUILDING ADDITION. ERECT STEEL RAILING AT SECOND FLOOR LEVEL.
3. REMOVE CURB ON STORAGE PAD TO CLEAR GRADE BEAM OF NEW BUILDING ADDITION.
4. REMOVE EXISTING CATCHBASIN INSERT PIPE STUB IN ST-8-N1.
5. INSTALL 9 STANDARD METAL SHEET BOUND MISSING PERIMETER OF BUILDING ADDITION BY 16 FEET HIGH. DO NOT BLOCK DOORS.



SOUTH ELEVATION



EAST ELEVATION

JAN 09 2001

SCALE FOR THIS DRAWING

000243

INDEX CODE
08X 5500 A 01404

NATIONAL LEAD COMPANY OF OHIO
FEED MATERIALS PRODUCTION CENTER
FERNALD, OHIO

U.S. ATOMIC ENERGY COMMISSION

PLANT 8 STORAGE AREA

DRUM STORAGE BUILDING

PLAN & ELEVATIONS

ENGINEERING DIVISION

PROJECT NO. 8-87 CP 60-64

DRAWN BY CLIFT CHECKED / APPROVED

DATE 12-28-60 SCALE 1"=1'-0"

DWG. NO. 8-4385 REVISION 0

REF. DWG. NO.	REF. DWG. TITLE	NO.	REVISIONS	DATE	BY

FOR INFORMATION ONLY
CADD SERVICES

REFERENCE DRAWING	
DRAWING NO.	TITLE
M-00731	GENERAL ARRANGEMENT-PLAN-SOUTH

3873

000244

JAN 0 9 2001

REV NO	ISSUE OR REVISION PURPOSE - DESCRIPTION	DRAWN DETAILS AND DATE	CHKD	DATE
2	TANK 15 & PUMPS RELOCATED, SLAB, FORUM EXTENDED, WALLS & CURB REVISION DELISTED.	WALSH 7/24/01	RMH	7/24/01
1	REVISED LOCATION OF P-18X-2200 & 2400 A/B	WALSH 7/11/01	RMH	7/11/01
0	CERTIFIED FOR CONSTRUCTION	CAB 1-23-01	JAH	1-23-01

UNITED STATES
DEPARTMENT OF ENERGY

JACOBS ENGINEERING GROUP INC.
PASADENA, CALIFORNIA

CONTRACT NO. N-77208 JOB NO. 3900

PROJECT NAME
PRODUCTIVITY RETENTION

DRAWING TITLE
GENERAL SUMP PLANT 18
GENERAL ARRANGEMENT
PLAN-NORTH

DRAWN BY	DATE	DESIGN & CHECKED BY	DATE	CHECKED BY	DATE
WALSH	5-4-84	PF MK SMITH	10-26-87	[illegible]	10-26-87

PLANT	UNIT	BLOCK	SCALE	CLASS
PWPD			1"=10'	

SUBMITTED FOR APPROVAL: [signature] DATE 2-22-01
APPROVAL RECOMMENDED: [signature] DATE 2-23-01
DRAWING APPROVED: [signature] DATE 3-6-01

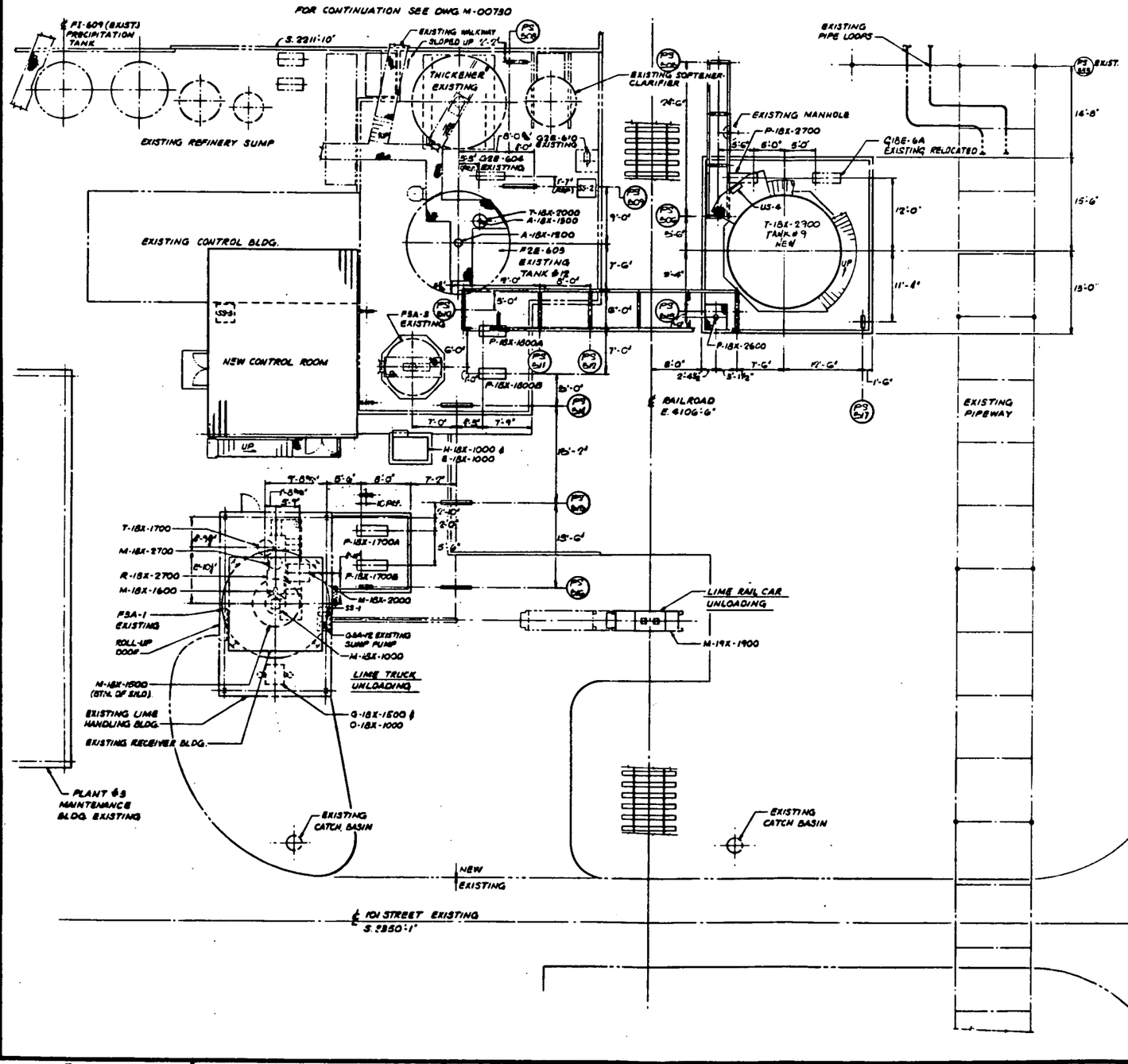
WBS CODE FOR INFORMATION ONLY								
ALL PROJECTS	UNIT							
01.3.5.3.3.0.0.0.3	P101	86-D-149	18X	3900	M	00730	2	

DO NOT SCALE REDUCED DRAWING

FOR INFORMATION ONLY
CADD SERVICES

REFERENCE DRAWING	
DRAWING NO.	TITLE
M-00730	GENERAL ARRANGEMENT PLAN - NORTH

3873



DO NOT SCALE REDUCED DRAWINGS

000245

JAN 09 2001

NO	ISSUE OR REVISION PURPOSE - DESCRIPTION	DRAWN BY / DATE	CHECKED BY / DATE
0	CERTIFIED FOR CONSTRUCTION	MK SMITH 10-13-98	JW 10-13-98

UNITED STATES DEPARTMENT OF ENERGY

JACOBS ENGINEERING GROUP INC.
PASADENA, CALIFORNIA

CONTRACT NO N-77208 A-E NO. 3900

PROJECT NAME: PRODUCTIVITY RETENTION

DRAWING TITLE: GENERAL SUMP PLANT 18 GENERAL ARRANGEMENT PLAN - SOUTH

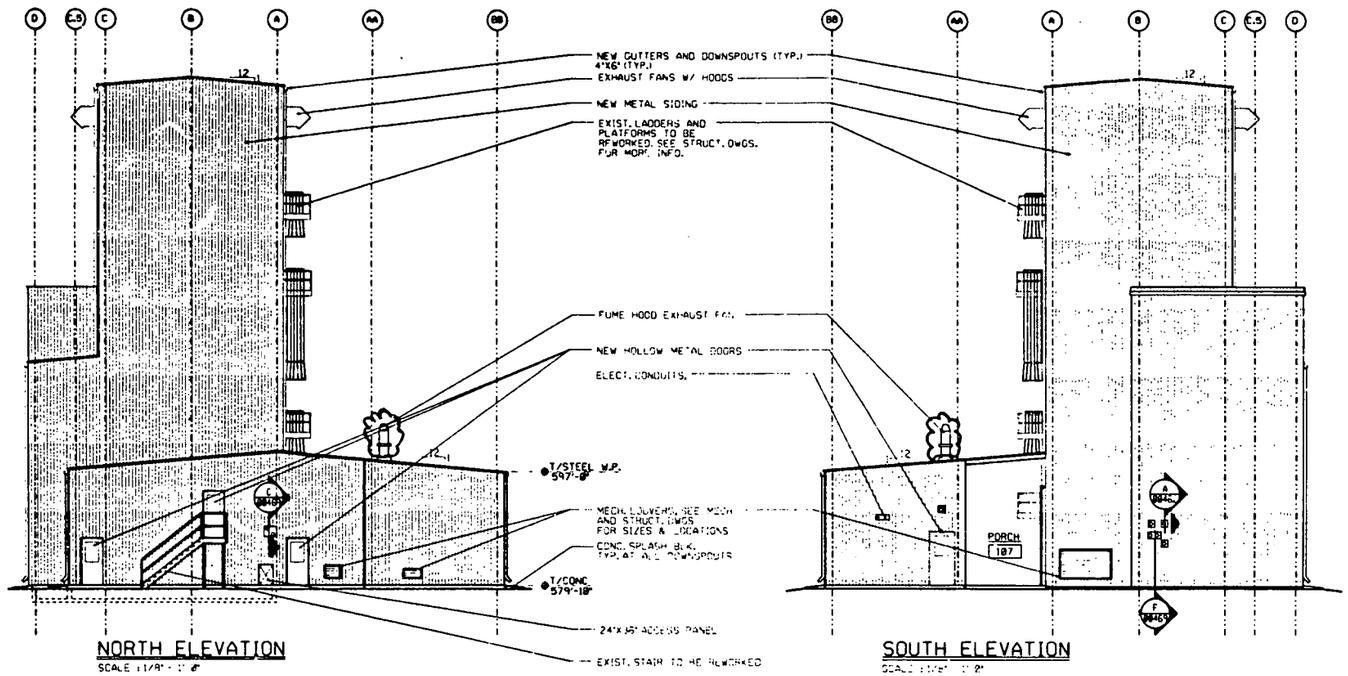
DRAWN BY	DATE	DESIGNED CHECKED BY	DATE	CHECKED BY	DATE
MK SMITH	11-5-86	MK SMITH	10-13-98	W. KIMMYE	10-13-98

PLANT	BLDG.	FLOOR	ROOM	CLASS
PWPG			V8-FD	

SUBMITTED FOR APPROVAL: DATE 2-27-87
APPROVED: DATE 3-3-87
APPROVED AS CONSTRUCTED: DATE
DRAWING APPROVED: DOE DATE 3/24/87

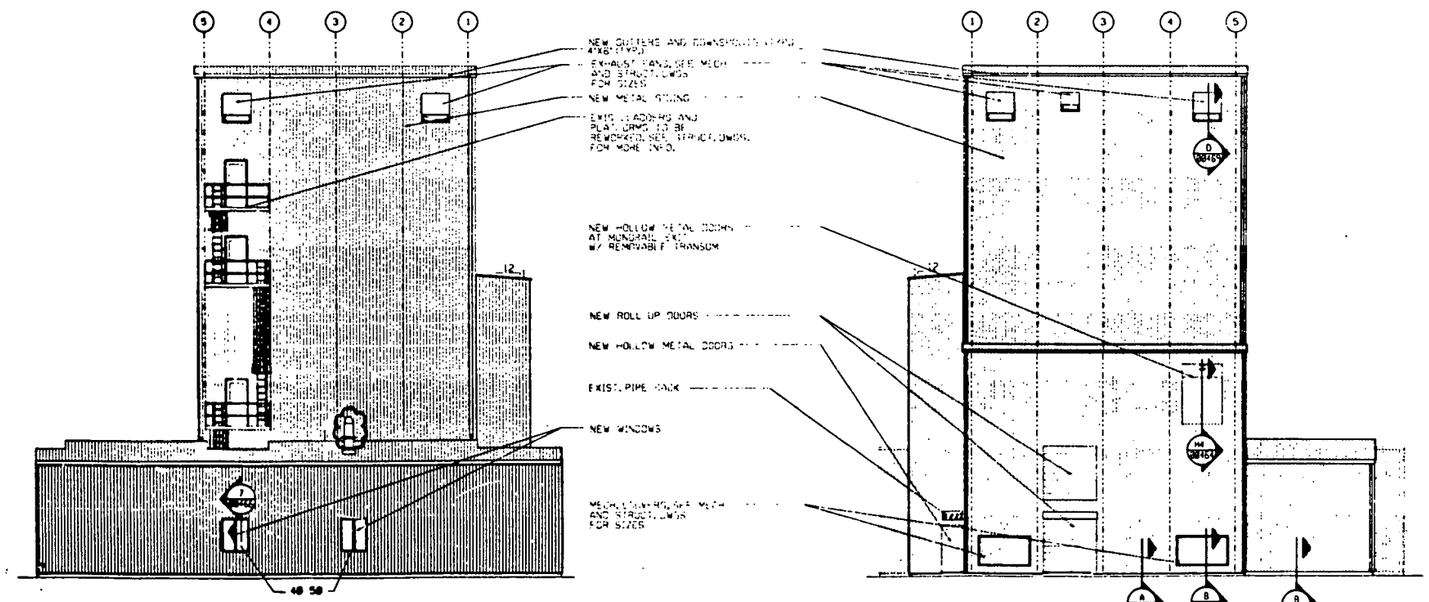
WBS CODE FOR INFORMATION ONLY: 01-8353-00103 | X | P102

PROJECT NO.					REV NO.
86-D-149	18X	3900	M	00731	0



NORTH ELEVATION
SCALE 1/8" = 1'-0"

SOUTH ELEVATION



WEST ELEVATION
SCALE 1/8" = 1'-0"

EAST ELEVATION

DO NOT SCALE REDUCED DRAWING

FOR INFORMATION ONLY
CADD SERVICES

NOTES

NOTE: ALL CLOUDED ITEMS ARE IN ALTERNATE BID ITEM NO. 1

3873

1	AS BUILTS	CM	6-10-99
0	CFC ISSUE	CM	11-1-97

UNITED STATES
DEPARTMENT OF ENERGY
FEED MATERIALS PRODUCTION CENTER

THE RALPH M. PARSONS COMPANY
ARCHITECTS - ENGINEERS
CHARLOTTE, N.C.

WATER POLLUTION CONTROL - PHASE II
BDN FACILITY UPGRADE

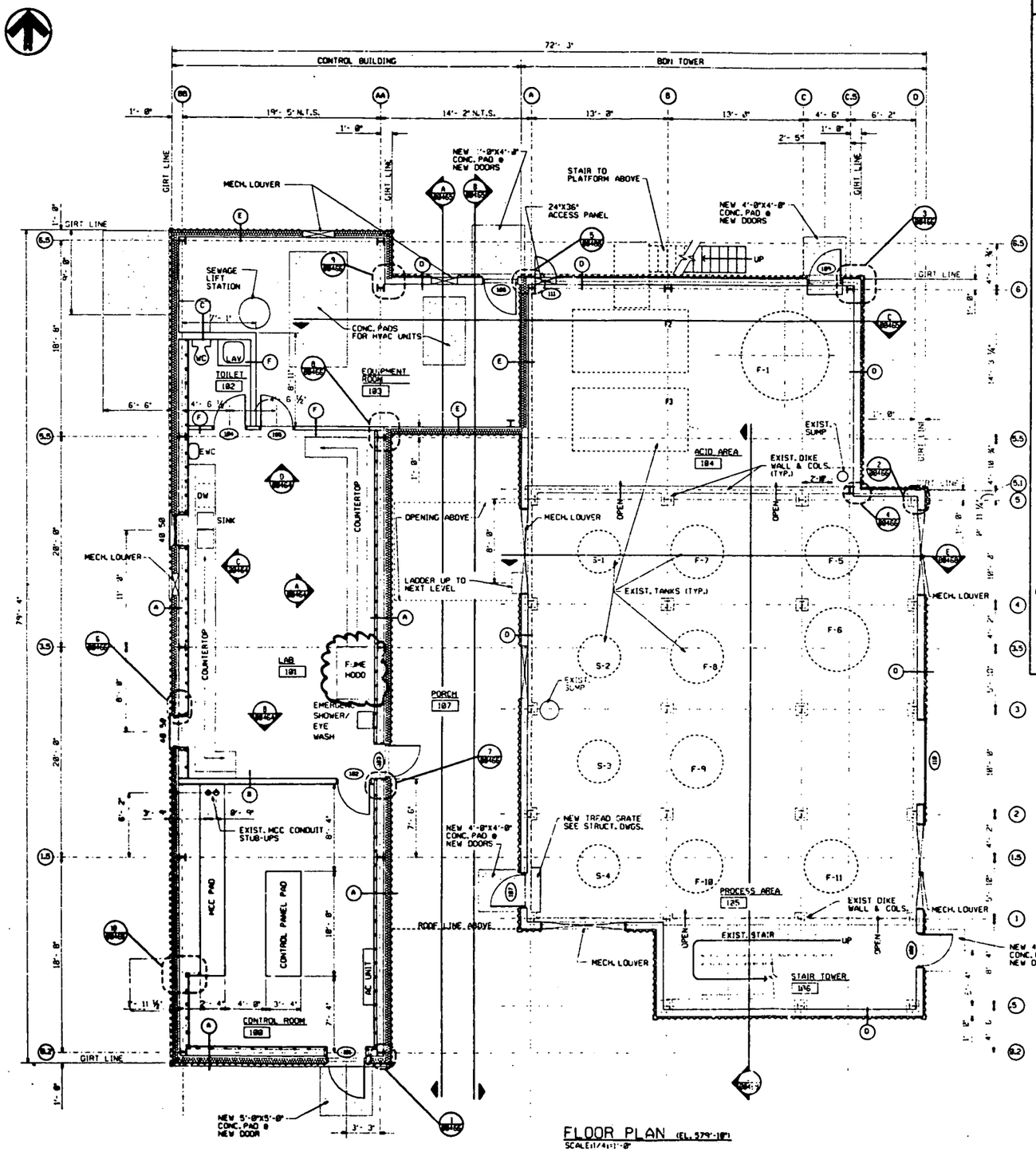
ARCHITECTURAL
ELEVATIONS

GARY FOX	9-7-99			
18			AS NOTED	U
83-0-146	188350IA WBS 1.3.03.01	18D-5900-A-00463		1

JAN 0 9. 2001

SEND PLOT TO: CHRIS HERTZ
DRAWN BY: GARY FOX
CAD NO. 5444MAS

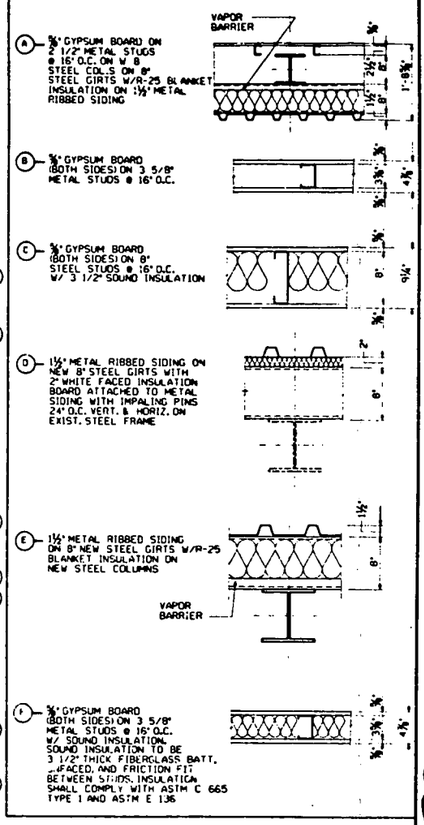
000246



FLOOR PLAN (EL. 579'-10")
SCALE: 1/4"=1'-0"

DO NOT SCALE REDUCED DRAWING

WALL TYPES



NOTES

NOTE:
ALL CLOUDED ITEMS ARE IN ALTERNATE BID ITEM NO. 1

NO.	DESCRIPTION	BY	DATE
1	AS BUILTS		
0	CFC ISSUE		6-15-99

UNITED STATES
DEPARTMENT OF ENERGY
FEED MATERIALS PRODUCTION CENTER

THE RALPH M. PARSONS COMPANY
ARCHITECTS - ENGINEERS
CHARLOTTE, N.C.

WATER POLLUTION CONTROL - PHASE II
BDN FACILITY UPGRADE

ARCHITECTURAL
FLOOR PLAN ELEV. 579'-10"

GARY FOX	6-17-99		
18	LEVEL 1	1/4"=1'-0"	U
	7/1/99		7/1/99
83-0-146	1883508A WBS 1.1.03.01	80-5900-A-00456	1

3873

FOR INFORMATION ONLY
CADD SERVICES

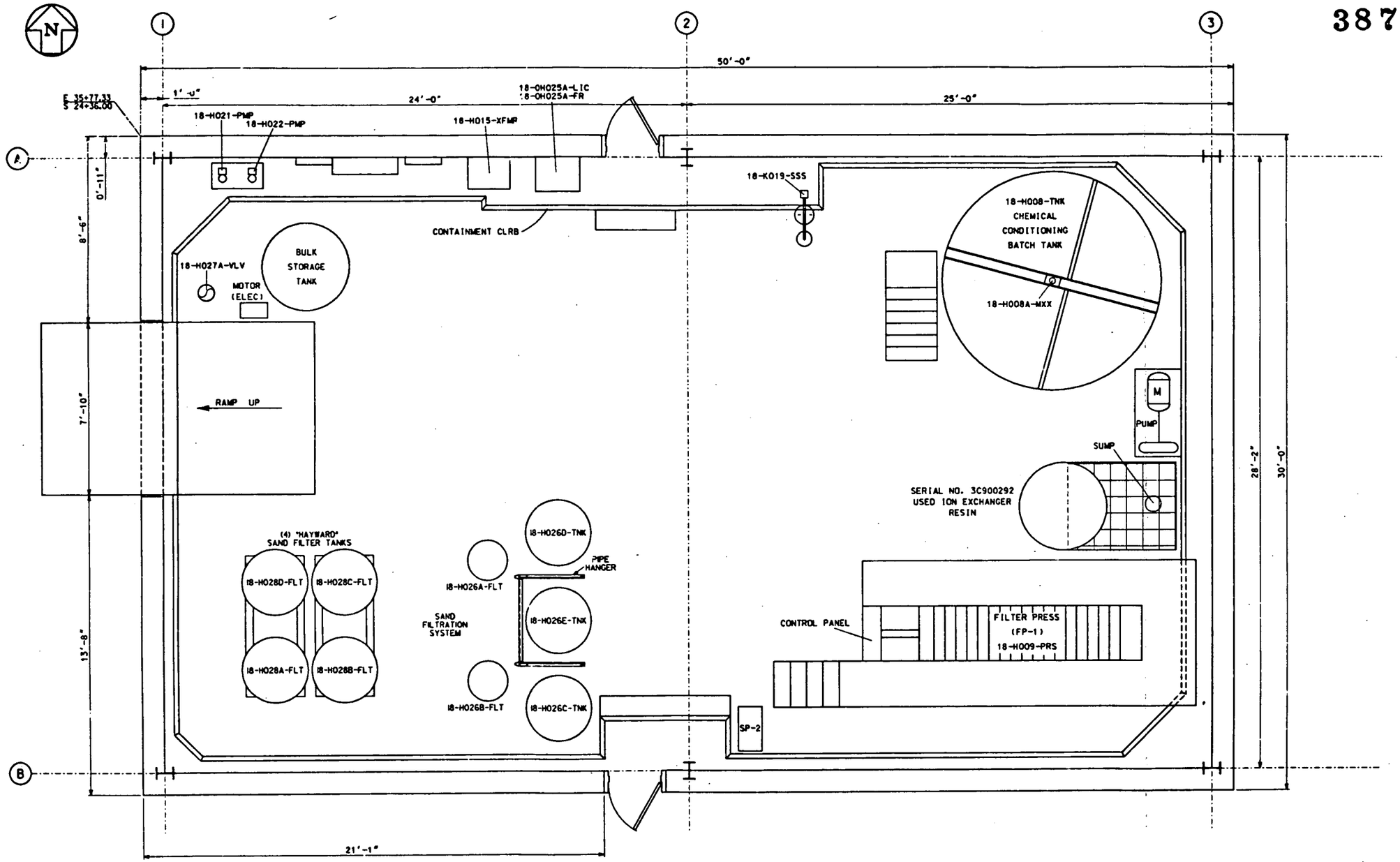
JAN 0 9, 2001

SEND PLOT TO: CHRIS HERTZ
DRAWN BY: GARY FOX
JOB NO. 14438456

000247

3873

FOR INFORMATION ONLY
CADD SERVICES



NO.	REVISIONS	DATE	DWN. BY	APPD.
1	UPDATED	8/4/95	SS	GP

NO.	REVISIONS	DATE	DWN. BY	APPD.	REF. DWG. NO.
					18D-5500-S-00995
					18D-5500-P-00990

DO NOT SCALE REDUCED DRAWING

NOTE: WEMCO C.A.D. DRAWING NOT TO BE REVISED MANUALLY

APPROVALS

CIVIL & STR.		SAFETY ENG.	
ELECTRICAL		MAINTENANCE	
ENGINEER		Q.A.	
INSTRUMENT			
MECHANICAL		FIRE PROTECT.	
		WASTE MANAGE.	
CHECKED	GEP	O.O.K.	
APPROVED	C.E. PAUL	RAD SECURITY	

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT CO. OF OHIO
FERNALD, OHIO
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
U.S. DEPARTMENT OF ENERGY

BLDG 18H
BIODENITRIFICATION EFFLUENT TREATMENT SYSTEM
FLOOR PLAN
SCALE: ½" = 1'-0"

DATE 8-23-95
DRAWN MC LOVE
18D-5500-A-01313 1

FILE NAME: FLOOR/18H.DGN

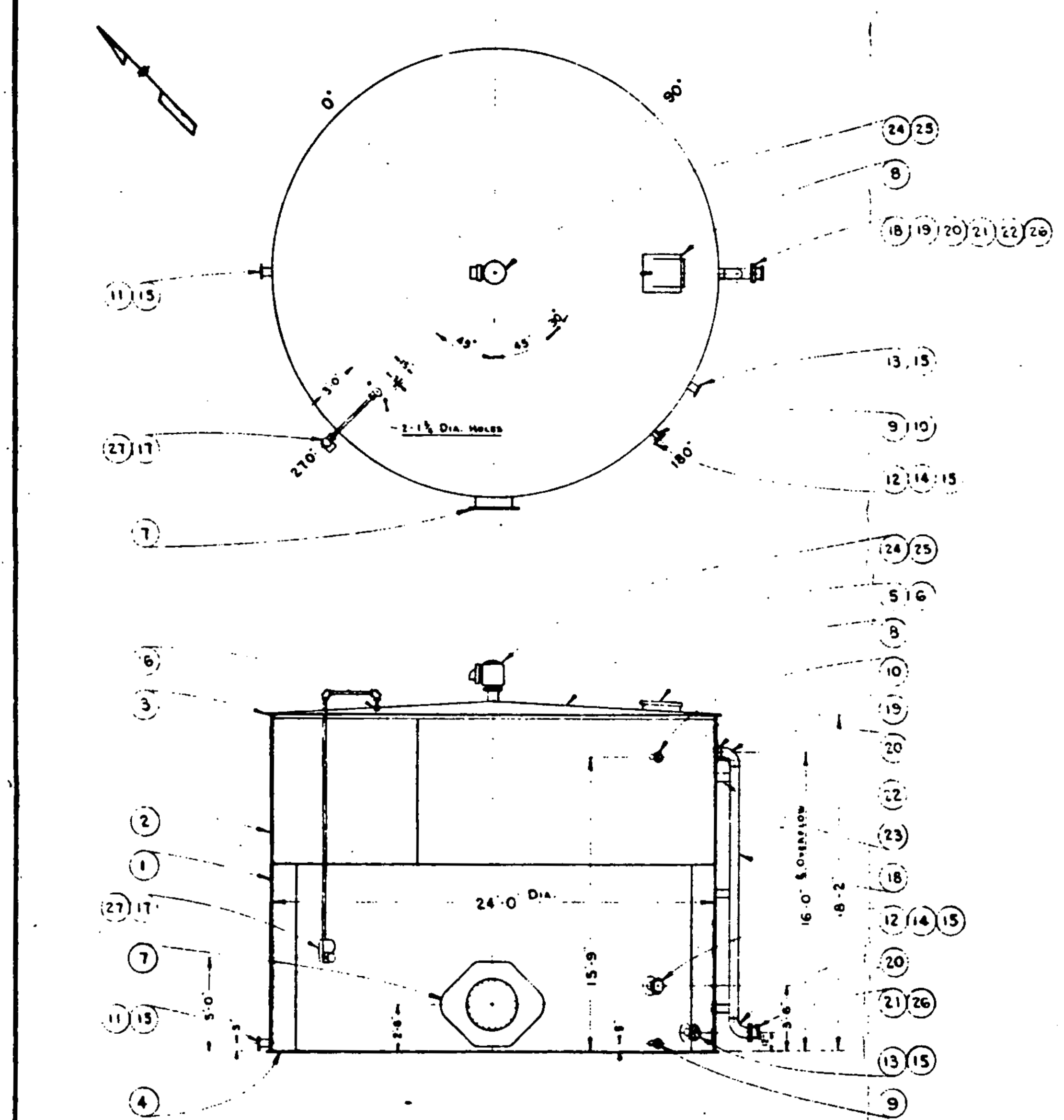
JAN 0 9 2001

000248

R18h.m(2154.ws10) joe@ws10. Mon Oct 2 09:25:48 EDT 1995

3873

03361



BILL OF MATERIAL				
ITEM	REQ'D	PART NO.	DESCRIPTION	WT.
1	3	S-1	PLATE ⅝" × 119" × 302 ⅞" LG. (CIRC 906 ⅝")	7,635
2	3	S-2	PLATE ⅝" × 96" × 302 ⅞" LG (CIRC. 906 ⅝")	6,098
3	3	TOP ANGLE	ANGLE 3" × 3" × ⅜" × 307 ⅞ LG (CIRC 923 ⅝")	554
4	1	00311	TANK BOTTOM (¼ PLATE)	4892
5	1	01380	CONE ROOF (3/16 PLATE)	3,705
6	1	03360	ROOF STRUCTURAL	2413
7	1	00124	24 DIA SHELL MANHOLE	350
8	1	00127	24" SQUARE ROOF HATCH	110
9	1	OUTLET	2" SCH 80 NOZZLE × 7" LG W/ 150" RFSO. FLANGE	7
10	1	HI LEVEL ALARM	2" SCH 80 NOZZLE × 7 LG W/150" RFSO. FLANGE	7
11	1	DRAIN	4 SCH 80 NOZZLE × 8 LG W/150" R.F.SO. FLANGE	19
12	1	SPARE	4" SCH 80 NOZZLE × 8" LG W/150" R.F.SO. FLANGE	19
13	1	FILL	4" SCH 80 NOZZLE × 8 LG W/150" RFSO FLANGE	19
14	1	SPARE	4 150" RF BLIND FLANGE	17
15	3		REINFORCING PLATE ¼" × 4⅝" I.D. × 12" O.D.	21
16	1	LEVEL GAGE	1½ NPT PIPE COUPLING	2
17	1		SHAND & JURS MODEL 92020 AUTOMATIC TANK GAGE	100
18	1	OVERFLOW	6" SCH 80 PIPE × 13' 6 LG	386
19	1	- -	6" SCH 80 PIPE × 3" LG	7
20	2	- -	6" EX HVY 90 LR ELBOW	46
21	1	- -	6 - 150" RFSO FLANGE	18
22	1	OVERFLOW	REINF PLATE ¼" × 6⅝ I.D. × 16 O.D	12
23	3		PLATE ⅜" × 5" × 8 11/16 LG.	14
24	1		6 SCH 80 NOZZLE × 9" LG W/ 150" RFSO FLANGE	39
25	1		6" CONSERVATION VENT & FLAME ARRESTOR (PROTECTOSEAL)	180
26	1		6" C.I. FLANGED FLAP VALVE	60
27	1		TRANSMITTER GPE MODEL No. #3K 20-01-01-01-03	20

TOTAL WT. 26,766

NOTES:

1. TANK TO BE FURNISHED WITH ALTECH INDUSTRIES INC. INTERNAL FLOATING DECK COMPLETE WITH INSTALLATION OF ALL ACCESSORIES. SIDE VENTILATOR/OVERFLOW'S ON TANK SHELL ARE NOT REQUIRED.
2. ALL GASKET MATERIAL TO ⅛" TK COMPRESSED ASBESTOS.
3. ALL BOLTS AND NUTS TO BE SA 325.

REFERENCES: ITEM No. F-4

WITHERUP FABRICATION AND ERECTION INC.

54,000 GAL. METHANOL TANK
24'-0" DIA. × 18'-2" HIGH
U.S. DEPT. OF ENERGY FERNALD, OHIO

SCALE ⅜" = 1'-0

DRAWN C.D.M. DATE 12-18-84

S.O. No. 31184

DRAWING No. 03361

B	CDM		ADDED ITEMS No. 24, 25, 26, 27
A	CDM		ADDED OVERFLOW
NO.	BY	DATE	DESCRIPTION

REVISIONS

FOR INFORMATION ONLY
CADD SERVICES

NO.	REVISIONS	DATE	DWN. BY	APPD.
0	ISSUED FOR REFERENCE	1/20/99	GEP	GEP

REF. DWG. NO.

NOTE: FLUOR DANIEL FERNALD CADD DRAWING, DO NOT REVISE MANUALLY.

CONFIGURATION MANAGEMENT DRAWING

McPaul 1/20/99
COGNIZANT ENGINEER DATE

APPROVALS

CIVIL & STR.		SAFETY ENG.	
ELECTRICAL		MAINTENANCE	
ENGINEER		FIRE PROTECT.	
INSTRUMENT		WASTE MANAGE	
MECHANICAL		SECURITY	
		CRU	
CHECKED			
APPROVED	McPaul		

Fernald Environmental Management Project

FLUOR DANIEL FERNALD

U.S. DEPARTMENT OF ENERGY

SOUTHEAST OF SURGE LAGOON STRUCTURE

54K GAL. METHANOL TANK (F-4)
24'-0" DIA. X 18'-2" HIGH
DETAILS

DATE 1-20-99
DRAWN G.E. PAUL

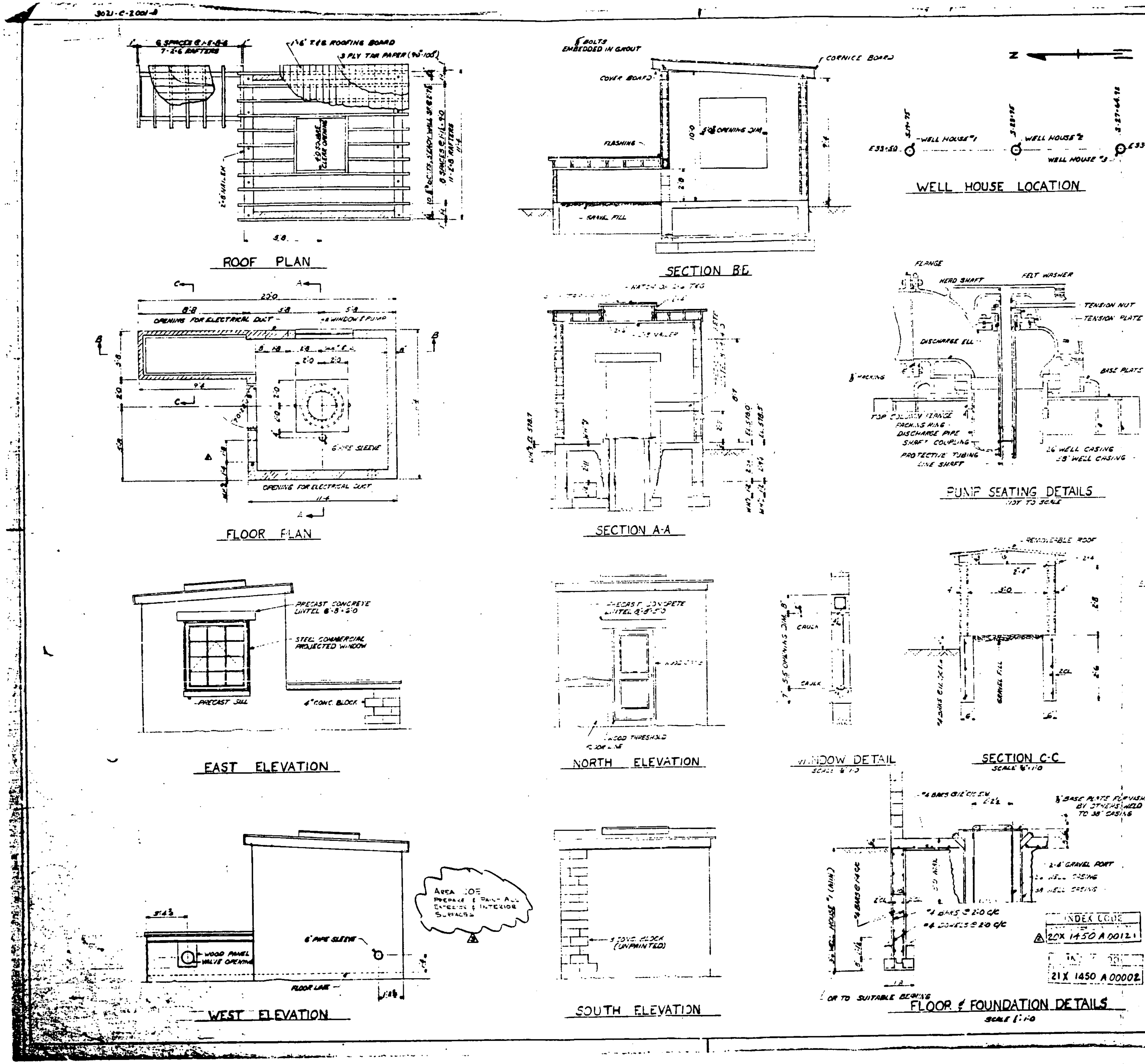
18A-5500-M-01375 0

FILE NAME:

JAN 0 9 2001

000249

FOR INFORMATION ONLY
CADD SERVICES



GENERAL NOTES

1. REINFORCING STEEL SHALL BE INTERMEDIATE GRADE BILLET STEEL BARS IN ACCORDANCE WITH LATEST REVISION OF A.S.T.M. SPECIFICATIONS A-15 & A-305
2. CONCRETE SHALL BE CLASS "B" (2500#:8")
3. CONCRETE BLOCKS, CAST STONE LINTELS, SILLS, MORTAR, WORKMANSHIP TO BE IN ACCORDANCE WITH SPECIFICATIONS FOR JOB NO. 3014, APPROVED 7-10-51, PREVIOUSLY SUBMITTED & REVISED.
4. LUMBER TO BE NO. 1 COMMON DOUGLAS FIR OR SOUTHERN YELLOW PINE S4S & SIZED AS SHOWN ON DRAWING. FINISH SIZES SHALL CONFORM TO YARD SIZE STANDARD OF AMERICAN LUMBER STANDARDS.
5. DOOR TO BE A STANDARD WOOD DOOR MADE TO SIZE & DESIGN AS SHOWN ON DRAWING, OR APPROVED EQUAL.
6. STEEL SASH, PLACING, GLAZING, HARDWARE, PAINTING, TO BE IN ACCORDANCE WITH SPECIFICATIONS FOR JOB NO. 3014, APPROVED 7/10/51, PREVIOUSLY SUBMITTED & REVISED.
7. ALL FOOTING TO BE AT LEAST 3'-0 BELOW FINISHED GRADE.
8. WINDOW TO BE MANUFACTURED BY THE TRUSCON STEEL CO. CATALOG NO. A-3416I OR APPROVED EQUAL.

3873

PRINT RECORD

REFERENCE DRAWINGS

TITLE	DRAWING NUMBER
PLOT PLAN	3000-AA-01-A
ELECTRIC POWER SYSTEM	3021-C-3011-A
PLANS & ELEVATIONS OF RAW WELL PIPING	3021-H-50-A
FOUNDATION WALL REINFORCING	DSA-305

DO NOT SCALE REDUCED DRAWING

JAN 0 9 2001

REVISIONS

NO.	DATE	DESCRIPTION	MADE BY	APP'D
3	3-88	PLANTWIDE PAINTING FY88 - PA0068301	T.B.	DS
2	8/ /88	DWG. NO CHANGE		
1		ADDITION OF MASONRY OPENINGS FOR ELECTRICAL DUCTS & REVISED NOT. DWG.	J.C.E. T.L.C.	

APPROVED FOR A.E.C. BY
DATE

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

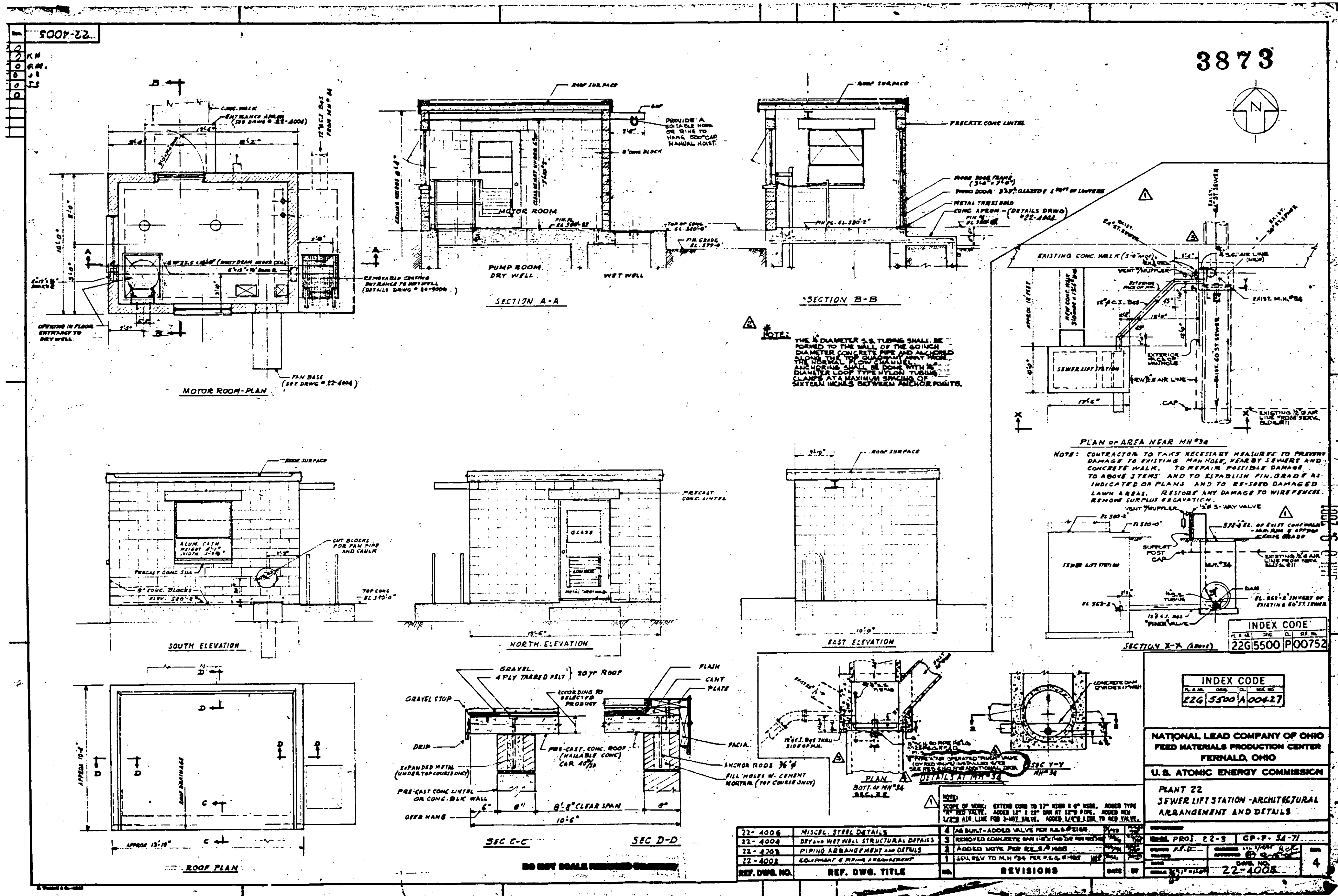
CONTRACT No. AT 30-1-1068
FEED MATERIALS PRODUCTION CENTER
FERNALD AREA

ARCHITECTURAL
WELL HOUSE
PLANS, ELEVATIONS & SECTIONS

DATE 11-25-51
SCALE 1/4" = 1'-0
DRAWN J.C.E.
CATALYTIC CONSTRUCTION CO.
1528 WALNUT STREET
PHILA 2, PA
APPROVED FOR CONSTRUCTION
A-44
DRAWING NO. 3021-C-2001-A
3

000250

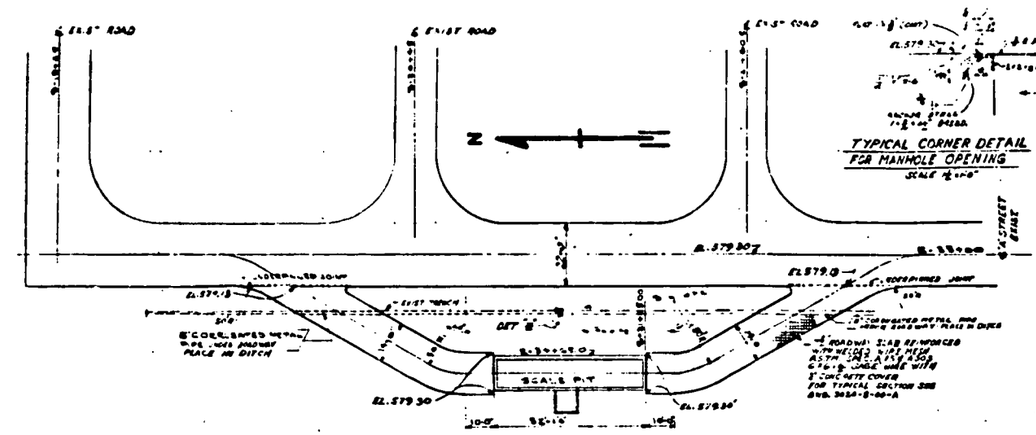
FOR INFORMATION ONLY
CADD SERVICES

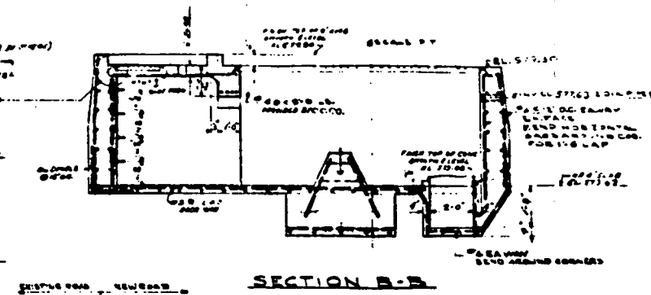


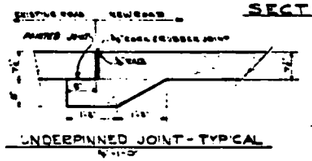
000251

FOR INFORMATION ONLY
CADD SERVICES

3873

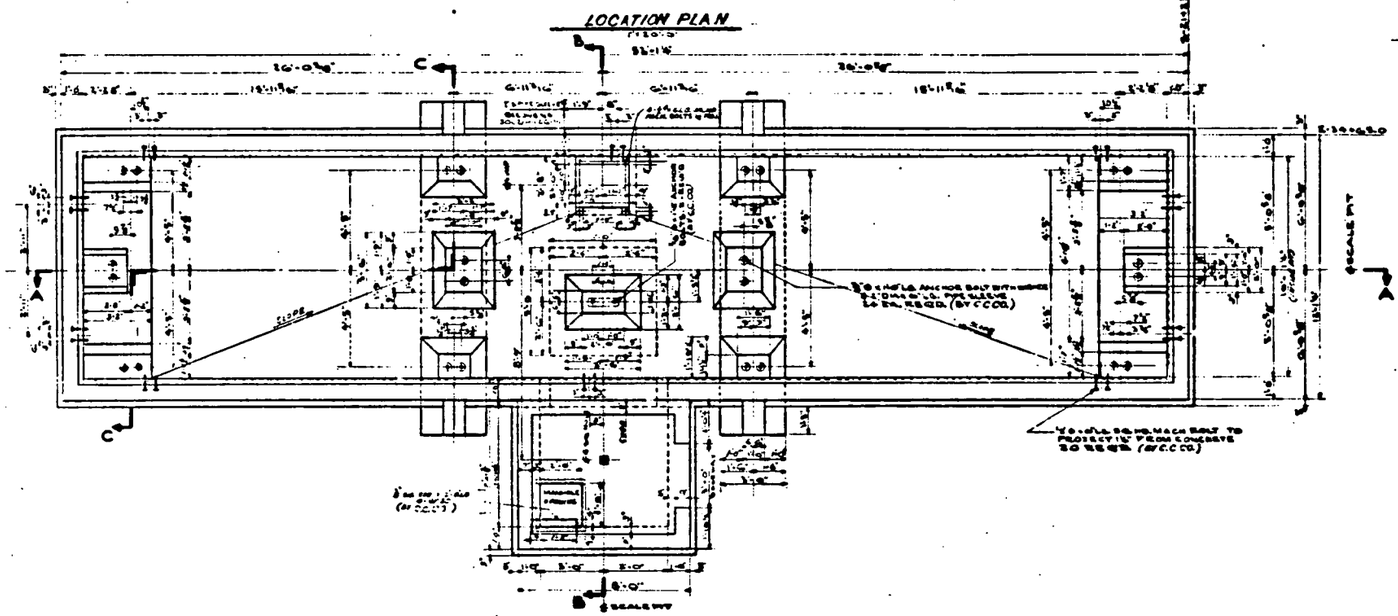


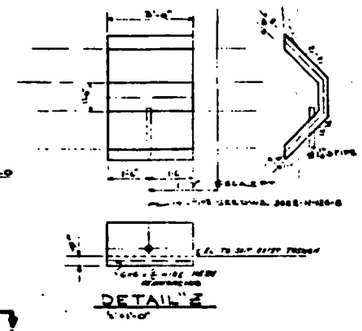


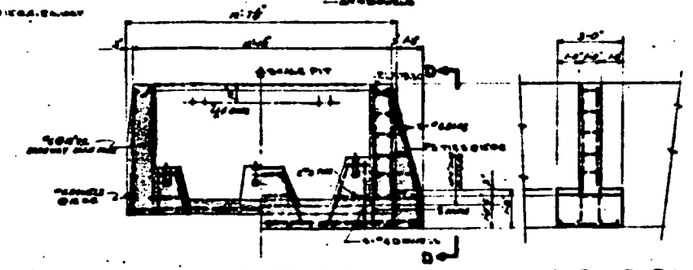


GENERAL NOTES

1. FOR GENERAL NOTES AND REFERENCE DRAWINGS FOR ROADWAYS, APRONS AND CURBING SEE DWG NO 3024-S-01-A
2. REINFORCING STEEL SHALL BE INTERMEDIATE GRADE BILLET STEEL IN ACCORDANCE WITH A.C.I. 318-47 BUILDING CODE.
3. CONCRETE FOR SCALE PIT TO BE CLASS B 2500 P.S.I.
4. ALL PIERS IN SCALE PIT OF EQUAL HEIGHT MUST BE LEVEL AND IN SAME PLANE.
5. ALL SCALE PIT DIMENSIONS, PIER ELEVATIONS, WALL AND SLAB THICKNESS, ETC. TAKEN FROM TOLEDO SCALE CO STANDARD DRAWING NO R-35587







REFERENCE DRAWINGS

TITLE	DRAWING NO
PLAN OF ROADS & APRONS	3024-S-01-A
SUMP PUMP ARR'GT	3022-M-126-B
BIDDING PLAN FOR ROADWAYS & APRONS	3024-S-34-A

SCALE FOR THIS DRAWING

ALL MATERIAL ON THIS PLAN GEORGE A. FULLER CO. EXCEPT AS NOTED

NO	DATE	DESCRIPTION	MADE BY	APP'D
6				
5				
4				
3				
2				
1				

REVISIONS

APPROVED FOR A.E.C. BY _____
DATE _____

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

CONTRACT No. AT-30-1-1060
FEED MATERIALS PRODUCTION CENTER
FERNALD AREA

PLANS & DETAILS OF TRUCK SCALE PIT & APPROACHES

DATE 5-27-53	OFFICE OF CATALYTIC CONSTRUCTION CO. 1500 WALNUT STREET PHILA. 2, PA.
SCALE 1/4"=1'-0" UNLESS NOTED	
DRAWN GRISSEAL	APPROVED FOR CONSTRUCTION
CHECKED Ewe	DRAWING NO. 3022-A-20-A

APPROVED
B
C
D
E

INSPECTOR
220 1450 S 00126

PRINT CLERK

JAN 0 9, 2001

000252

94-4008

3873

TRENCH SUMP PUMP DISCHARGE

TO (2) PUMPS NEAREST WEST SIDE OF K-65 BUILDING (G-54-5 & G-54-4)

DRUM HANDLING BUILDING

TO (2) PUMPS ON EAST SIDE OF K-65 BUILDING (NEAREST SHIELDING WALL) (G-54-2 & G-54-12)

TO FILTRATE LIQUOR STORAGE TANK

DC-1-2" TO TOP Nº 3 TK.

DC-2-4" TO TOP Nº 3 TK.

K-65 STORAGE TK.

ZO-11-3"
DC-1-2-4"
XJ-4-3"
DC-1-2"
ZO-20-3"

TO TOP OF Nº 2 TANK

TO BASE OF TANK

PUMPS IN SUMP. (G-54-5 & G-54-6)

TO DECANT SUMP

AIR BLEED LINE & VALVE

TRENCH DRAIN TO FLUORIDE PIT

TO BASE OF TANK

TO TOP OF Nº 1 TANK

ZO-11-3"-A1

XJ-4-3"-A1

XJ-1-3"-A1

TO U.A.P. PIT

XJ-2-3"-A1

DC-1-2"-A1

XJ-1-3"-A1

DC-2-4"

ELL REMOVED, TEMPORARY HOOKUP WITH SPOOL PIECE

K-65 STORAGE TK.

K-65 TRENCH PIPING

SEE LEGEND FOR EXPLANATION OF SYMBOLS

CATCH BASIN #62

FIRE HOSE

WEST END
HOT RAFFINATE AREA

XJ-2-3"

XJ-1-3"

GEN. SUMP LINE

LEGEND

- EXISTING PIPING
- EXISTING VALVES
- PIPING MAINTAINED BY ENGINEERING DIVISION
- VALVES MAINTAINED BY ENGINEERING DIVISION
- FIRE HOSE MAINTAINED BY ENGINEERING DIVISION

JAN 0 9 2001

FOR INFORMATION ONLY
CADD SERVICES

INDEX CODE

PL. & AR.	DWG.	CL.	SEQ. NO.
34X	5500P	00063	

000253

NATIONAL LEAD COMPANY OF OHIO
FEED MATERIALS PRODUCTION CENTER
FERNALD, OHIO

U.S. ATOMIC ENERGY COMMISSION

K-65 STORAGE AREA

FLOW DIAGRAM OF K-65 TRENCH PIPING

ENGINEERING DIVISION

PROJECT NO. 8-45 CP-F

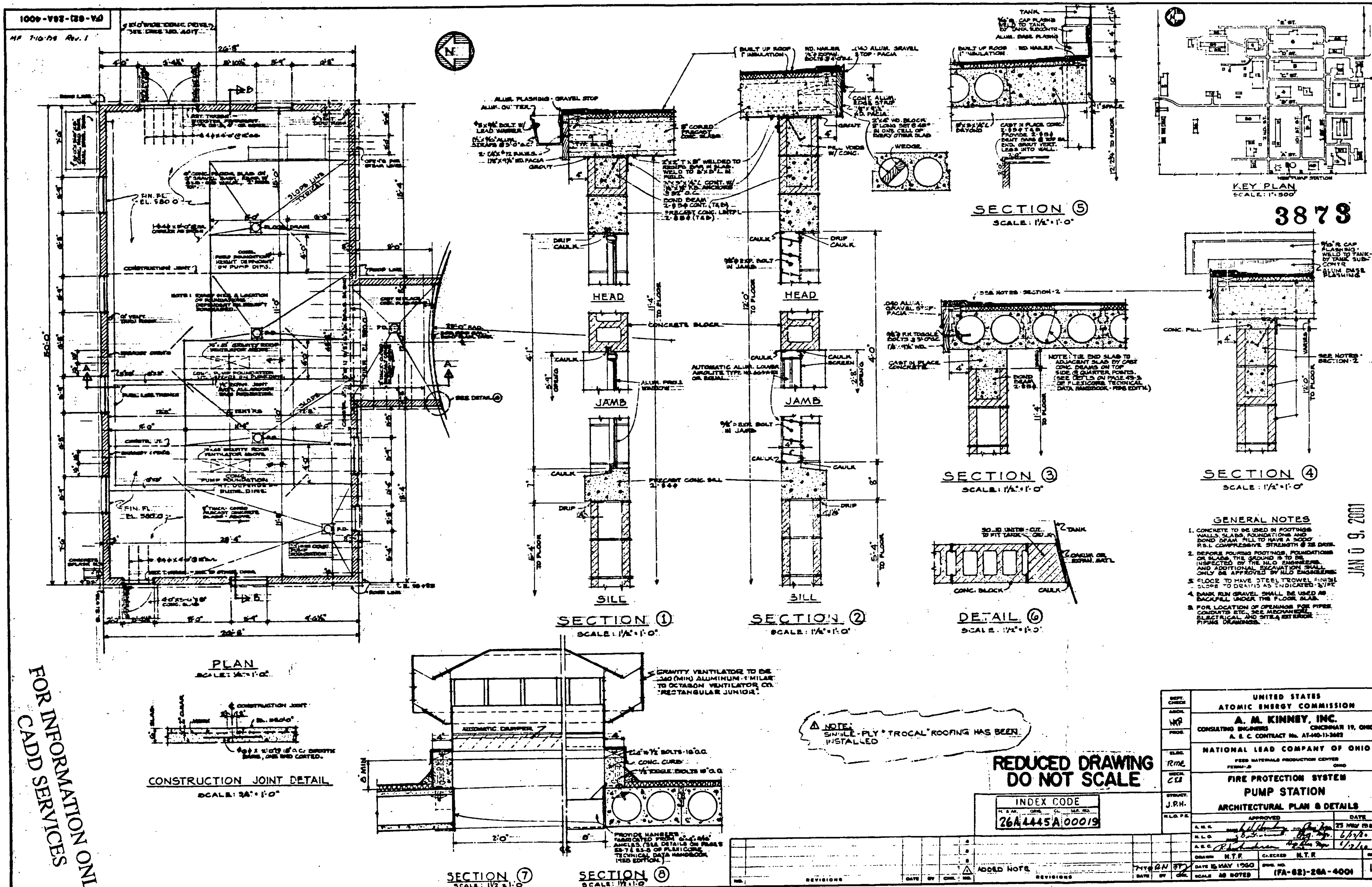
DRAWN • TRACED • CHECKED • APPROVED

DATE 8-15-58 SCALE NONE

DWG. NO. 34-4008 REV. 0

REF. DWG. NO.	REF. DWG. TITLE

NO.	REVISIONS	DATE	BY

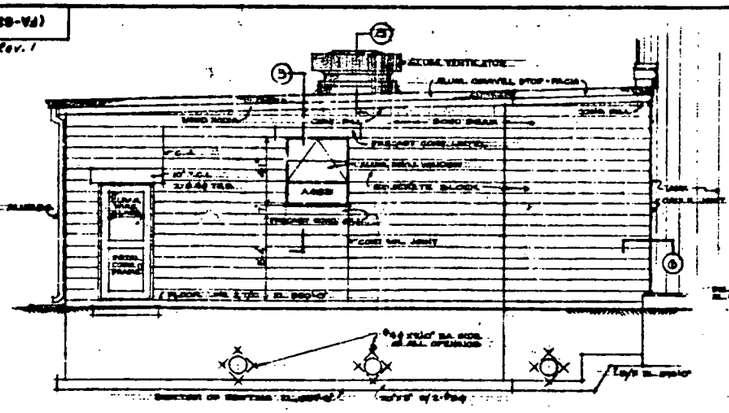


PLAN
SCALE: 1/4" = 1'-0"
CONSTRUCTION JOINT DETAIL
SCALE: 3/4" = 1'-0"
SECTION 1
SCALE: 1 1/2" = 1'-0"
SECTION 2
SCALE: 1 1/2" = 1'-0"
SECTION 3
SCALE: 1 1/2" = 1'-0"
SECTION 4
SCALE: 1 1/2" = 1'-0"
SECTION 5
SCALE: 1 1/2" = 1'-0"
DETAIL 6
SCALE: 1 1/2" = 1'-0"
SECTION 7
SCALE: 1 1/2" = 1'-0"
SECTION 8
SCALE: 1 1/2" = 1'-0"
KEY PLAN
SCALE: 1" = 500'
HEAD
JAMB
SILL
CONCRETE BLOCK
PRECAST CONC. SILL
AUTOMATIC ALUM. LOUVER
GRAVITY VENTILATOR TO BE .040 (MIN) ALUMINUM "MILAR" TO OCTAGON VENTILATOR CO. "RECTANGULAR JUNIOR"
AUTOMATIC DAMPER
GENERAL NOTES
1. CONCRETE TO BE USED IN FOOTINGS, WALLS, SLABS, FOUNDATIONS AND BOND BEAM FILL TO HAVE A 3000# P.S.I. COMPRESSIVE STRENGTH @ 28 DAYS.
2. BEFORE POURING FOOTINGS, FOUNDATIONS OR SLABS, THE GROUND IS TO BE INSPECTED BY THE NLO ENGINEERS, AND ADDITIONAL EXCAVATION SHALL ONLY BE APPROVED BY NLO ENGINEERS.
3. FLOOR TO HAVE STEEL TROWEL FINISH - SLOPE TO DRAINS AS INDICATED.
4. BANK RUN GRAVEL SHALL BE USED AS BACKFILL UNDER THE FLOOR SLAB.
5. FOR LOCATION OF OPENINGS FOR PIPES, CONDUITS ETC. SEE MECHANICAL, ELECTRICAL AND SITE & EXTERIOR PIPING DRAWINGS.
NOTE: SINGLE-PLY "TROCAL" ROOFING HAS BEEN INSTALLED
REDUCED DRAWING
DO NOT SCALE
INDEX CODE
26A 4445 A 00019
UNITED STATES ATOMIC ENERGY COMMISSION
A. M. KINNEY, INC.
CONSULTING ENGINEERS CINCINNATI 19, OHIO
A. E. C. CONTRACT No. AT-(40-1)-2602
NATIONAL LEAD COMPANY OF OHIO
FEED MATERIALS PRODUCTION CENTER
FIRE PROTECTION SYSTEM
PUMP STATION
ARCHITECTURAL PLAN & DETAILS
DRAWN N.T.F.
CHECKED N.T.F.
DATE 16 MAY 1960
SCALE AS NOTED
(FA-62)-26A-4001
ADDED NOTE
REVISIONS
3873
JAN 09 2001
FOR INFORMATION ONLY
CADD SERVICES

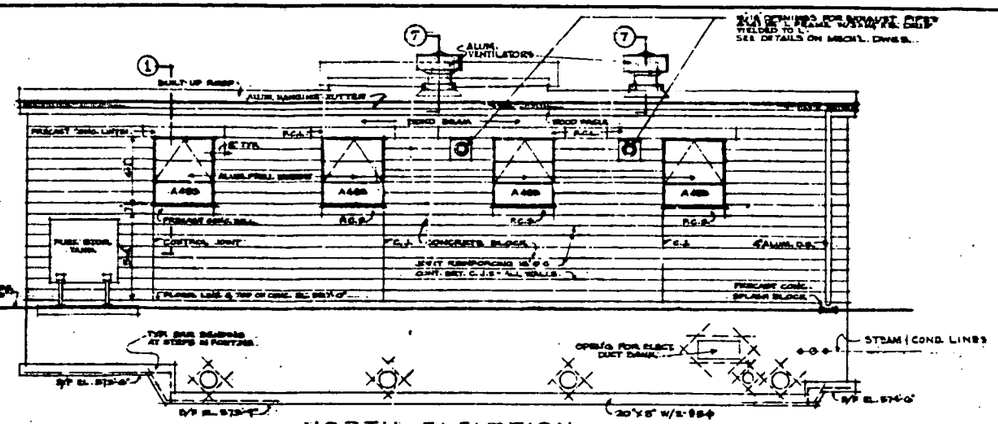
2009-783-(28-64)

AP 7-16-85 Rev. 1

3873



WEST ELEVATION



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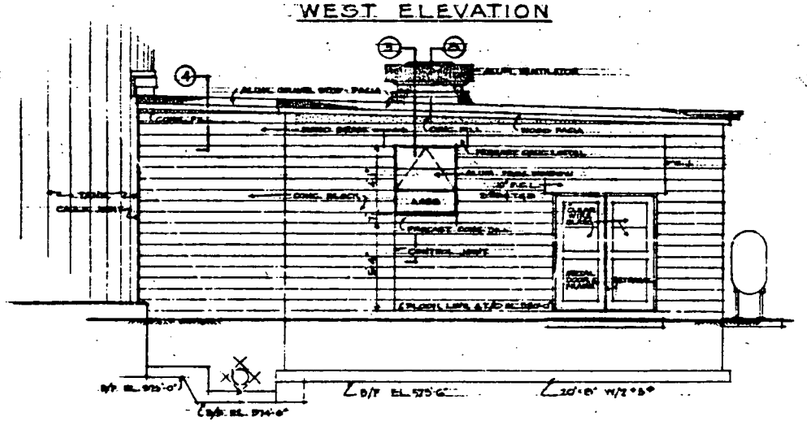

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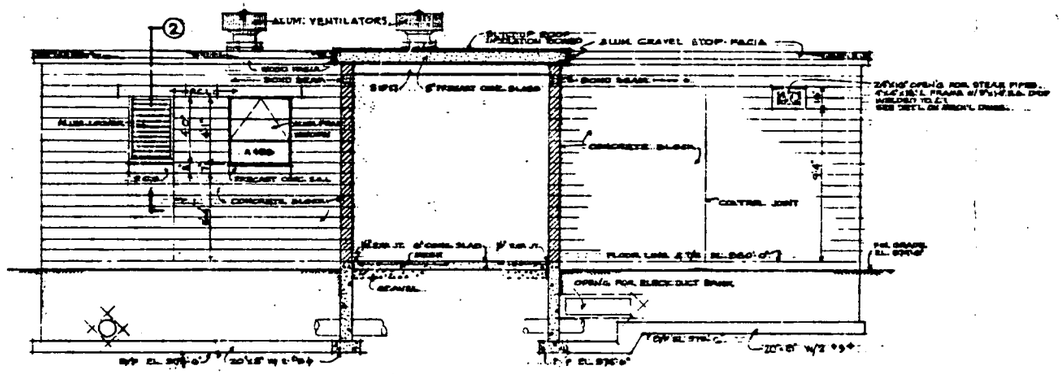
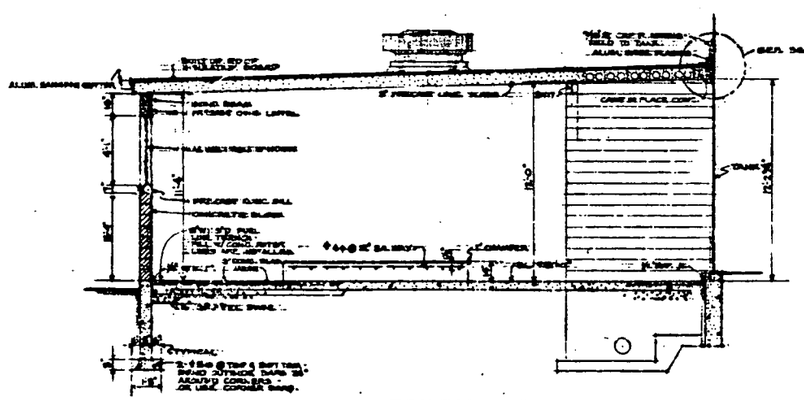


SOUTH ELEVATION



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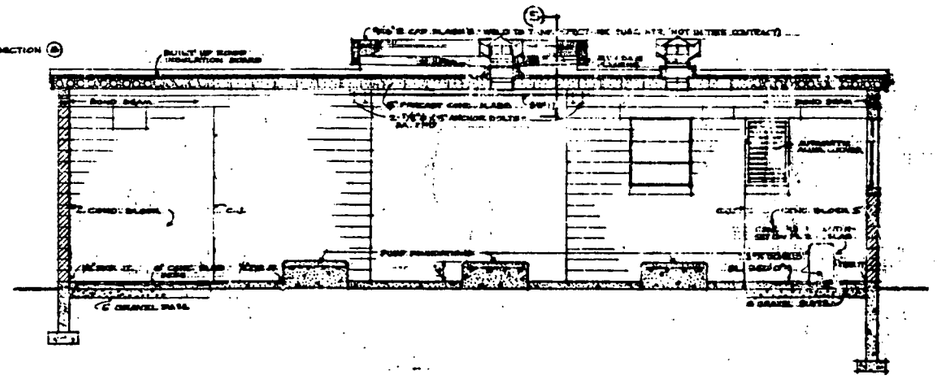


SECTION B-B

SCALE: 1/4"-1'-0"

⚠ NOTE: SINGLE-PLY "TROCAL" ROOFING HAS BEEN INSTALLED

FOR INFORMATION ONLY
CADD SERVICES

JAN 0 9. 2001

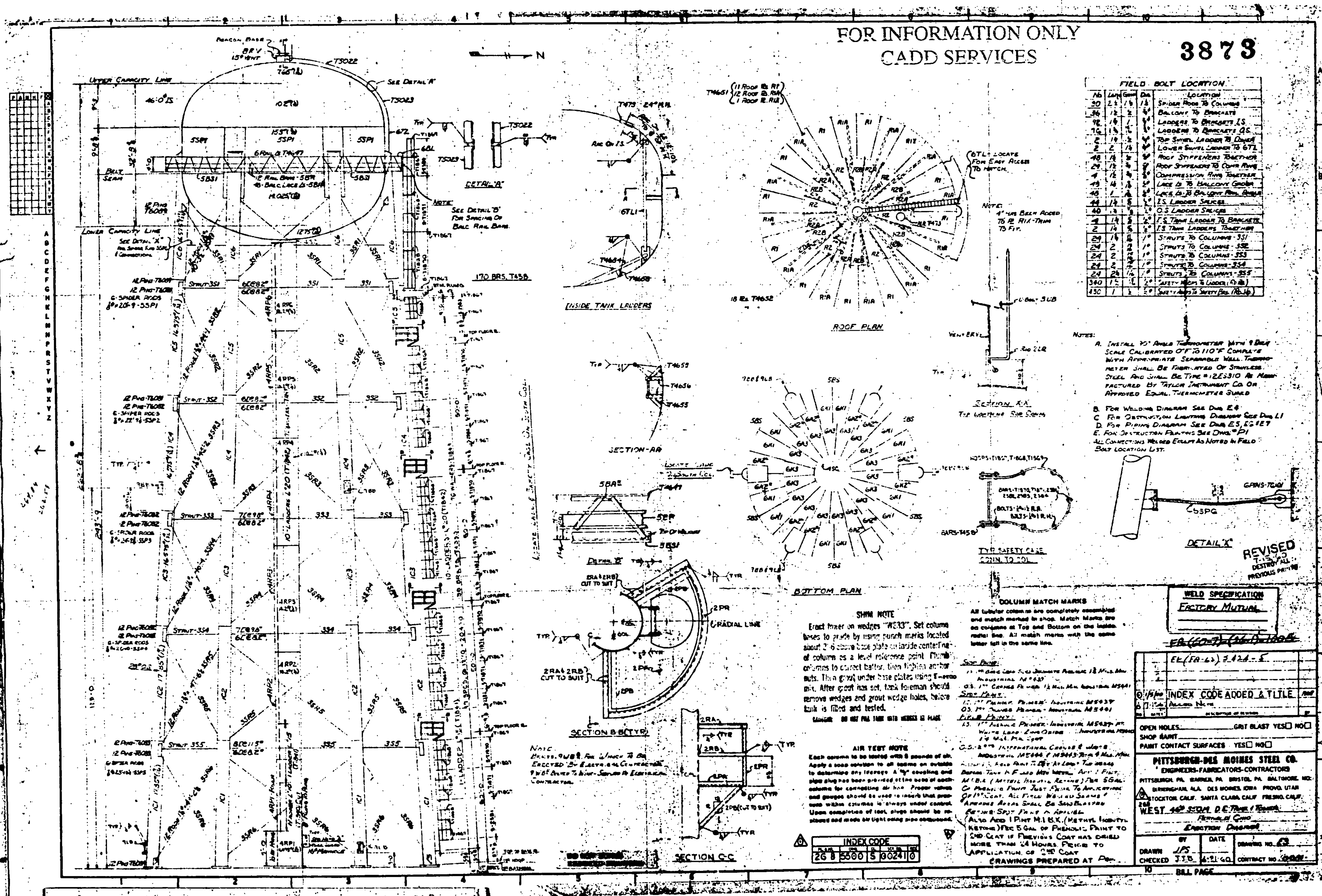
REDUCED DRAWING
DO NOT SCALE

INDEX CODE
26A4445A00020

DEPT. CHECK	UNITED STATES ATOMIC ENERGY COMMISSION		
ARCH.	A. M. KINNEY, INC. CONSULTING ENGINEERS CINCINNATI 19, OHIO A. E. C. CONTRACT No. AT-40-1-3682		
PROJ.	NATIONAL LEAD COMPANY OF OHIO FEED MATERIALS PRODUCTION CENTER FERNALD OHIO		
ELEC. R.M.E.	FIRE PROTECTION SYSTEM PUMP STATION		
MECH. C.S.H.	ARCHITECTURAL ELEVATIONS & SECTIONS		
STRUCT. J.P.H.	APPROVED		DATE
H.L.O. P.E.	A.M.K.		23 MAY 1960
	H.L.O.		6/7/60
	A.E.C.		6/7/60
	DRAWN H.T.F.	CHECKED H.T.F.	REV.
	DATE 16 MAY 1960	DWG. NO. (FA-62)-26A-4002	1
	SCALE AS NOTED		

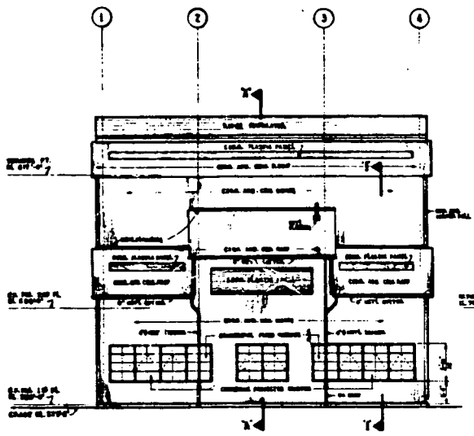
NO.	REVISIONS	DATE	BY	CHK.
1	ADDED NOTE REVISED FIN. ELEVS.	7-19-85 7-30-85	BN J.P.H.	JPH M.H.R.

000255

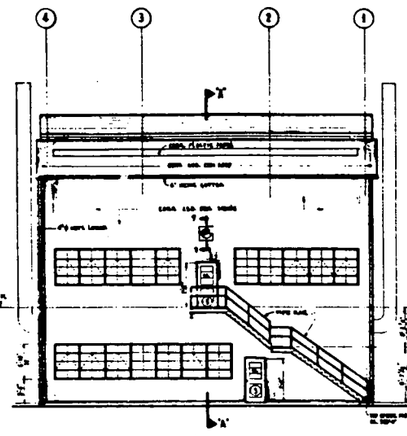

FOR INFORMATION ONLY
CADD SERVICES
3873
FIELD BOLT LOCATION
DETAIL "A"
INSIDE TANK LADDERS
ROOF PLAN
SECTION-AA
SECTION K-K
BOTTOM PLAN
TYP. SAFETY CAGE CONN. TO COL.
DETAIL "X"
REVISED
SECTION B-B (TYP.)
SECTION C-C
SHIM NOTE
AIR TEST NOTE
COLUMN MATCH MARKS
WELD SPECIFICATION
FACTORY MUTUAL
INDEX CODE ADDED & TITLE
INDEX CODE
2G 8 5500 S 60241 0
OPEN HOLES
SHOP PAINT
PAINT CONTACT SURFACES
PITTSBURGH-DES MOINES STEEL CO.
ENGINEERS-FABRICATORS-CONTRACTORS
DRAWINGS PREPARED AT
BILL PAGE

000256

3873



SOUTH ELEVATION



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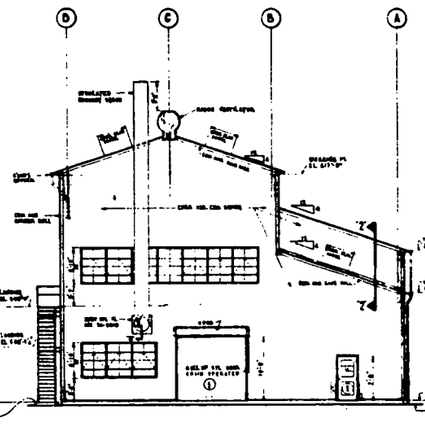

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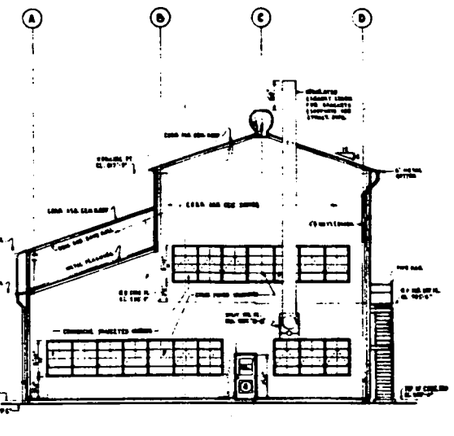

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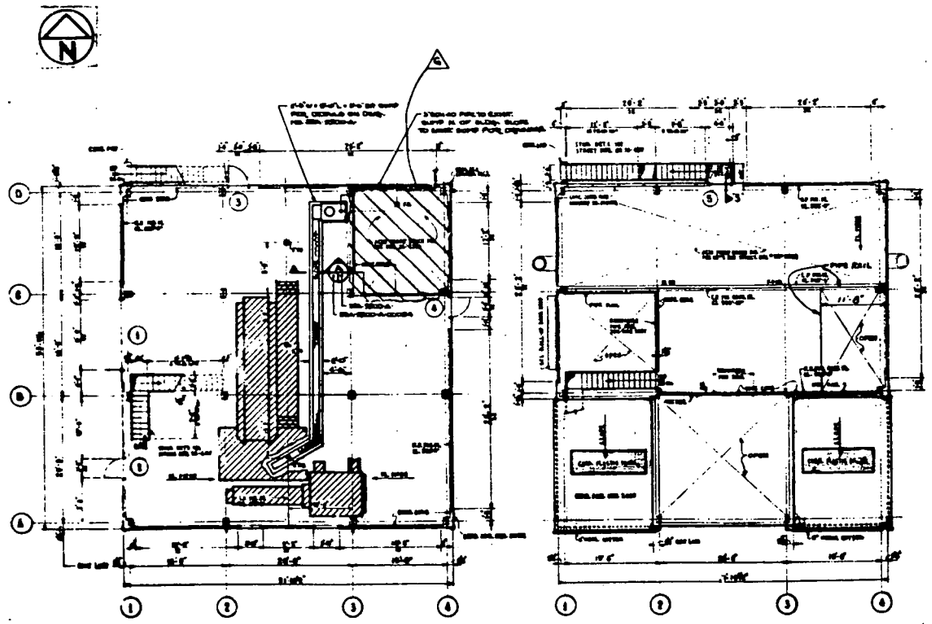
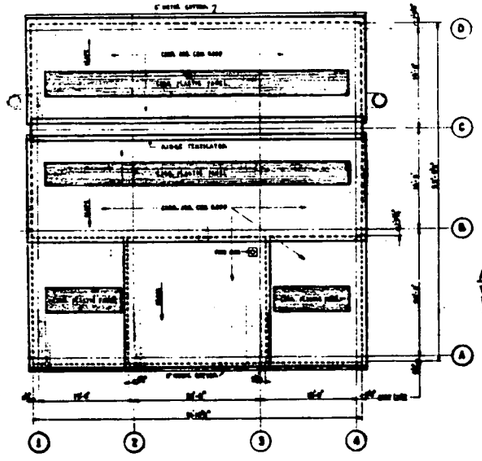


1st FLOOR PLAN

2nd FLOOR PLAN



ROOF PLAN

DOOR SCHEDULE

NO.	SIZE WIDTH	SIZE HEIGHT	TYP.	SWING	MAT'L	FRAME	CHANGE	HARDWARE	REMARKS
1	4'-0"	6'-8"	-	—	[illegible]	—	—	——	[illegible]
2	3'-0"	7'-0"	1¾"	[illegible]	[illegible]	-	—	[illegible]	[illegible]
3	3'-0"	7'-0"	1¾"	[illegible]	-	-	—	-	-
4	3'-0"	7'-0"	1¾"	[illegible]	-	-	—	-	-
5	3'-0"	7'-0"	1¾"	[illegible]	-	-	[illegible]	-	-

WINDOW SCHEDULE

SASH TYPE	SIZE WIDTH	SIZE HEIGHT	NO. REQ'D	REMARKS
COMMERCIAL MANUFTD	3'-0"	5'-0"	48	[illegible]
COMMERCIAL FIXED	3'-0"	5'-0"	20	-

NOTE: [illegible]

FOR ALL SECTIONS & DETAILS SEE [illegible]

INDEX CODE
02A 7000A 00957

9250-3A-3318 | 2

SECTIONS & DETAILS	9250-3A-3318
FLASHING PLAN	9250-3A-3320
02A PLAN - LIGHTING	4560-3A-3320
[illegible]	[illegible]
BILL OF MATERIAL	[illegible]
SPECIFICATIONS	[illegible]

U. S. ATOMIC ENERGY COMMISSION

SINGMASTER & BREYER

NATIONAL LEAD COMPANY OF OHIO

(SAPPINITE CALCINER BLDG.)
INCINERATOR BLDG.
PLANS - ELEVATIONS

		DATE
APPROVED	[illegible]	[illegible]
CHIEF ENGR.	[illegible]	[illegible]
A.E.C.	[illegible]	[illegible]
A.E.C.	[illegible]	[illegible]
DRAWN	[illegible]	[illegible]
CHECKED	[illegible]	[illegible]

3250-3A-3318 | 6

AREA 39A
PREPARE & PRINT ALL EXTERIOR VIEWS

INDEX CODE
39A 9300A 00084

NO.	REVISIONS	BY	DATE	APP'D
6	[illegible]	[illegible]	[illegible]	[illegible]
5	[illegible]	[illegible]	[illegible]	[illegible]
4	[illegible]	[illegible]	[illegible]	[illegible]
3	[illegible]	[illegible]	[illegible]	[illegible]
2	[illegible]	[illegible]	[illegible]	[illegible]
1	[illegible]	[illegible]	[illegible]	[illegible]

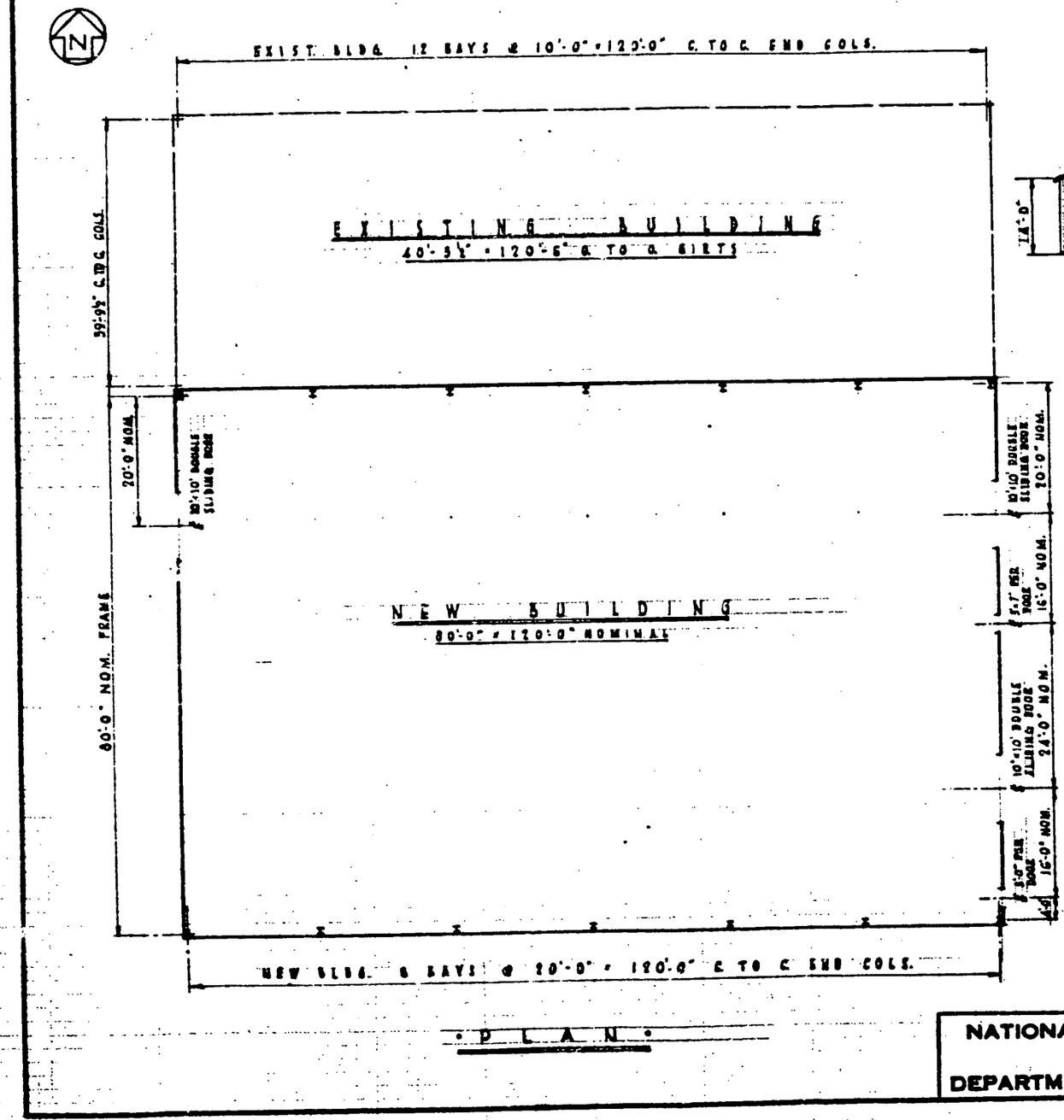
FOR INFORMATION ONLY
CADD SERVICES

JAN 09 2001

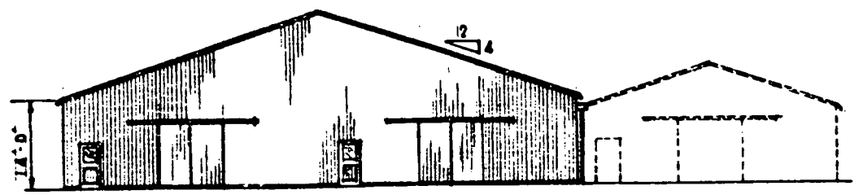
000257

FOR INFORMATION ONLY
CADD SERVICES

3873



• P L A N •



• E A S T E L E V A T I O N •

DESIGN LOAD CRITERIA

ROOF: 30 PSF LIVE LOAD PLUS DEAD LOAD

WIND: 20 PSF

INDEX CODE			
PL. & AR.	ORIG.	CL.	SER. NO.
45 A	5500	A	00048

L A B. M A C H. S H O P B L D G

P R E L I M I N A R Y L A Y O U T

NATIONAL LEAD COMPANY OF OHIO
FERNALD, OHIO
DEPARTMENT: ENGINEERING DIVISION

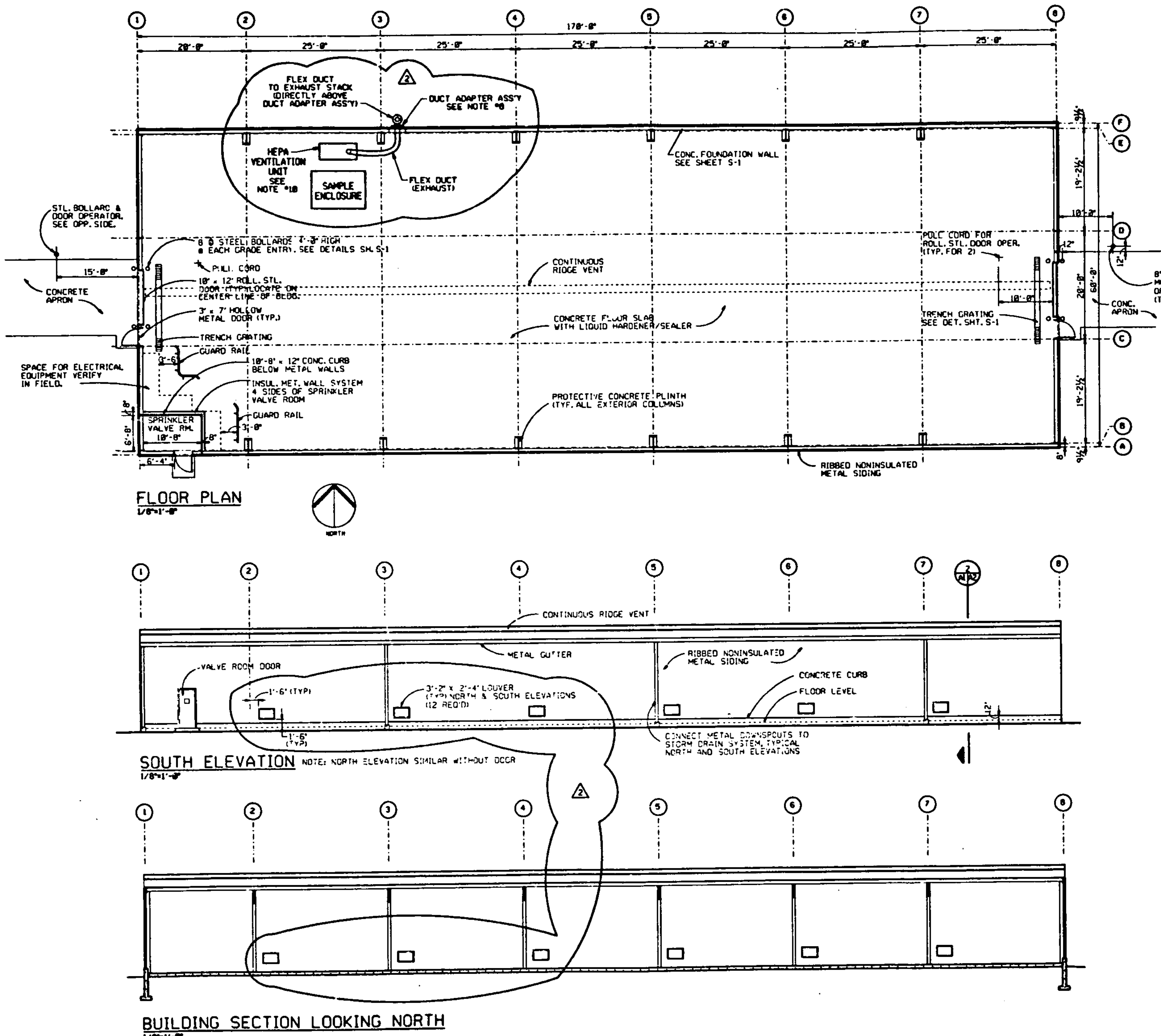
SCALE	NONE
DATE	10-2-58
CHARGE	45-18
DRAWN BY	V. H. H
APPROVED BY	

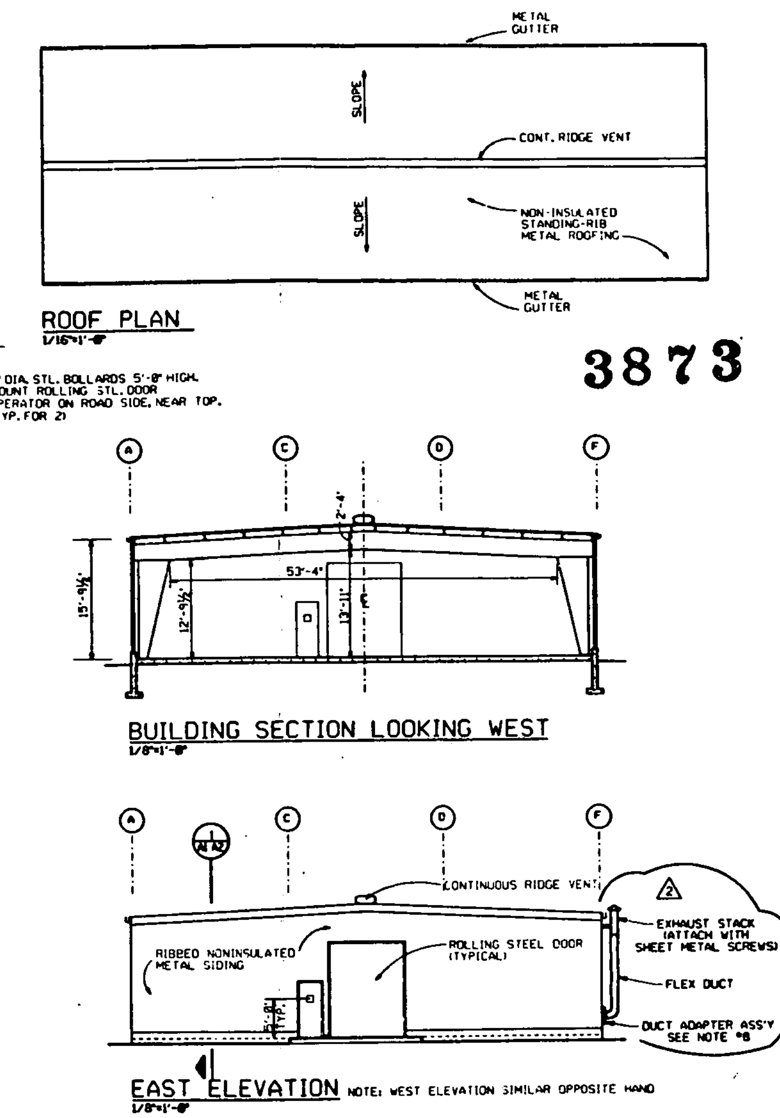
DR. NO. E-45-4

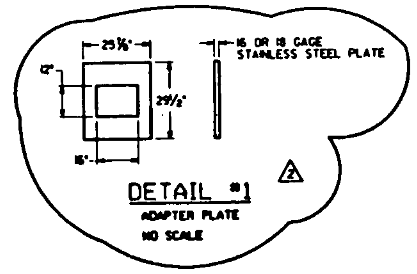
NLO-ENG-661 (12-8-58)

JAN 0 9 2001

000258

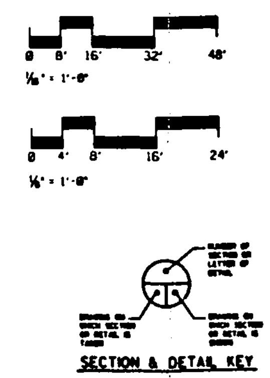






NOTES:
FOR ACCURATE CONSTRUCTION DETAIL OF THIS BUILDING REFER TO APPROVED ARMCO SHOP DRAWINGS (RED CONSTRUCTION SHEET NO'S RED-88-8-01 & RED-88-8-02

GRAPHIC SCALES



GENERAL NOTES

1. PRE-ENGINEERED BUILDING DESIGN, AS SHOWN. COLUMN LINES, OVERALL BUILDING DIMENSIONS, MAY VARY FROM THOSE SHOWN FOR OTHER ACCEPTABLE PRE-ENGINEERED BUILDING SYSTEMS, SUBJECT TO CLIENT APPROVAL.
2. STEEL FRAMING FOR ALL DOOR AND LOUVER OPENINGS TO BE PROVIDED BY MFR OF PRE-ENGINEERED BUILDING.
3. LOUVERS TO BE MANUALLY ADJUSTABLE.
4. CONTINUOUS RIDGE VENT, PROVIDED BY MFR OF PRE-ENGINEERED BUILDING, TO BE ALWAYS OPEN (NOT ADJUSTABLE).
5. HOLLOW METAL SWING DOORS TO BE 3'-0" x 7'-0", 1¾" THICK. FRAMES TO BE 2" x 5¾" HOLLOW METAL. 10"X10" VISION PNL. W/¼" WIRE GLASS.
6. METAL ROOFING TO BE INSULATED WITHIN LIMITS OF SPRINKLER VALVE ROOM ONLY.
7. ALL EQUIPMENT TO BE RELOCATED FROM BLDG. 56A WITH THE EXCEPTION OF A NEW ADAPTER PLATE. SEE DETAIL #1.
8. REMOVE LOUVER ASSEMBLY PRIOR TO INSTALLATION OF DUCT ADAPTER ASSEMBLY.
9. FOR ADDITIONAL FLOOR PLAN INFORMATION SEE DWG. #80X-5500-P-00028.
10. PLUG HEPA VENTILATION UNIT POWER CORD INTO WELDING RECEPTACLE LOCATED ON COLUMN F3 FOR ELECTRICAL POWER.

TO CORRELATE REFERENCED "AMK SHEET NO'S" TO FMPC DRAWING NUMBERS, SEE FMPC DRAWING NO.: 88X-4445-X-00821

2	ADDED EXHAUST DUCT WITH FLEX DUCT & DUCT ADAPTER ASSEMBLY PER RES #3166		3/18/97	
1	AS BUILT	EHZ 9-12-89		
0	CFC	EHZ	RJ3	CAP

UNITED STATES DEPARTMENT OF ENERGY
FEED MATERIALS PRODUCTION CENTER

THIS DRAWING PREPARED BY
A. M. KINNEY, INC.
CONSULTING ENGINEERS
CINCINNATI, OHIO

ENVIRONMENTAL, HEALTH & SAFETY IMPROVEMENTS

WAREHOUSE - PLANT 8
PLANS, SECTIONS, & ELEVATIONS

TAK/DLS 11-23-8 | EHZ 1 18-88 | 80 | AS NOTED
JOHN H. H. YUAN 3/25/88 | R. SKALKA 3/29/88 | GARY A. PLANTE 3/29/88
87-D-199 | 0087502 WBS U.3.2.02 | 80X-4445-A-00005 | A-1 | 2

/amh/bldg887-p188a2b0.201

JAN 09 2001

000259

APPENDIX E

3873

PHOTOGRAPHS

An extensive array of photographs was complied for the Multi-Complex D&D project along with reference descriptions that relate the subject and camera angle. The Building/Component/Location (exterior/interior) for each photograph is identified below:

TABLE E-1 Photographs

FEMP NEGATIVE NUMBER	BUILDING/COMPONENT	LOCATION
6383-D598	3H – Refinery Sump	Exterior – East
6383-D611	18B – General Sump	Exterior – East
7144-D22	2A – Ore Refinery Plant	Exterior – East
7144-D23	2A – Ore Refinery Plant	Exterior – NE looking West
7144-D19	2B – Control Building	Exterior – Northeast
7144-D14	2C – Bulk Lime Building	Exterior – South
7144-D15	2D – Metal Dissolver Bldg	Exterior – North
7144-D24	2H – Conveyor Tunnel	Exterior – North to South
7144-D13	3A – Maintenance Bldg	Exterior – Southeast
7144-D21	3L – Power Center Bldg	Exterior – Southeast
6681-152	8A – Recovery Plant	Exterior – East
6681-161	8A, 8C & 8G – Plant 8	Exterior – Southeast
6681-114	8B – Maintenance Bldg	Exterior – Southeast
6681-110	8E & 8H – Plant 8	Exterior – West
6681-154	8D – Railroad Filter Bldg	Exterior – North
7144-D5	80 – Plt. 8 Warehouse	Exterior – West
7144-D8	18D – Bio Towers	Exterior – Southwest
7144-D7	18H – BDN Facility	Exterior – Southwest
7125-D4	18J – Methanol Tank	Exterior – Southeast
7349-D1	22B – SS Lift Station	Exterior – Northwest
7144-D10	26B – Water Storage Tank	Exterior – Southeast

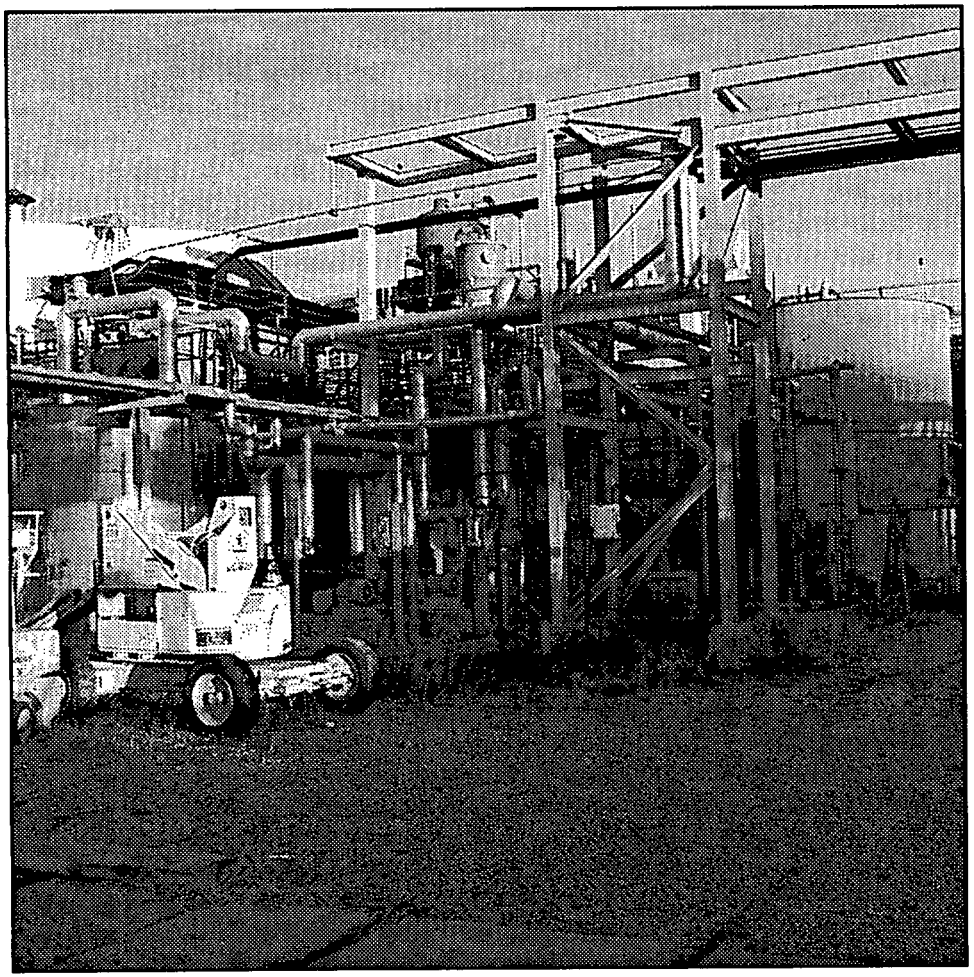
000260

TABLE E-1 Photographs (Cont'd)

FEMP NEGATIVE NUMBER	BUILDING/COMPONENT	LOCATION
7144-D9	26A – Pump House	Exterior – East
7144-D11	20E – Well House #1	Exterior
7144-D17	20F – Well House #2	Exterior – Southwest
7144-D6	20G – Well House #3	Exterior
7144-D12	45A – Maintenance Shop Building	Exterior – Northeast
6767-28	3B – Ozone Building	Exterior – Southeast
6502-53	3B – Ozone Building	Aerial – Northwest
6502-28	3D – NAR Towers & Tanks	Exterior – Northeast
6502-32	3D – NAR Towers & Tanks	Exterior – Southeast
6502-22	3E – Hot Raffinate Building	Exterior – Southwest
6502-23	3E – Hot Raffinate Building	Exterior – Northwest
6502-43	3J – Combined Raffinate Tanks	Exterior – Northeast
6502-60	3J – Combined Raffinate Tanks	Aerial – East to West
6502-16	3K – Old Cooling Water Tower	Exterior – Southwest
6502-71	39A – Incinerator Bldg	Exterior – Northwest
6502-70	39A – Incinerator Bldg	Exterior – West

NOTE: Photographs were not available for 2F (Cold Side Ore Conveyor), 22D (Scale House and Weigh Scale), 22E (Utility Trench) and 28D (Guard Post).

3H - REFINERY SUMP



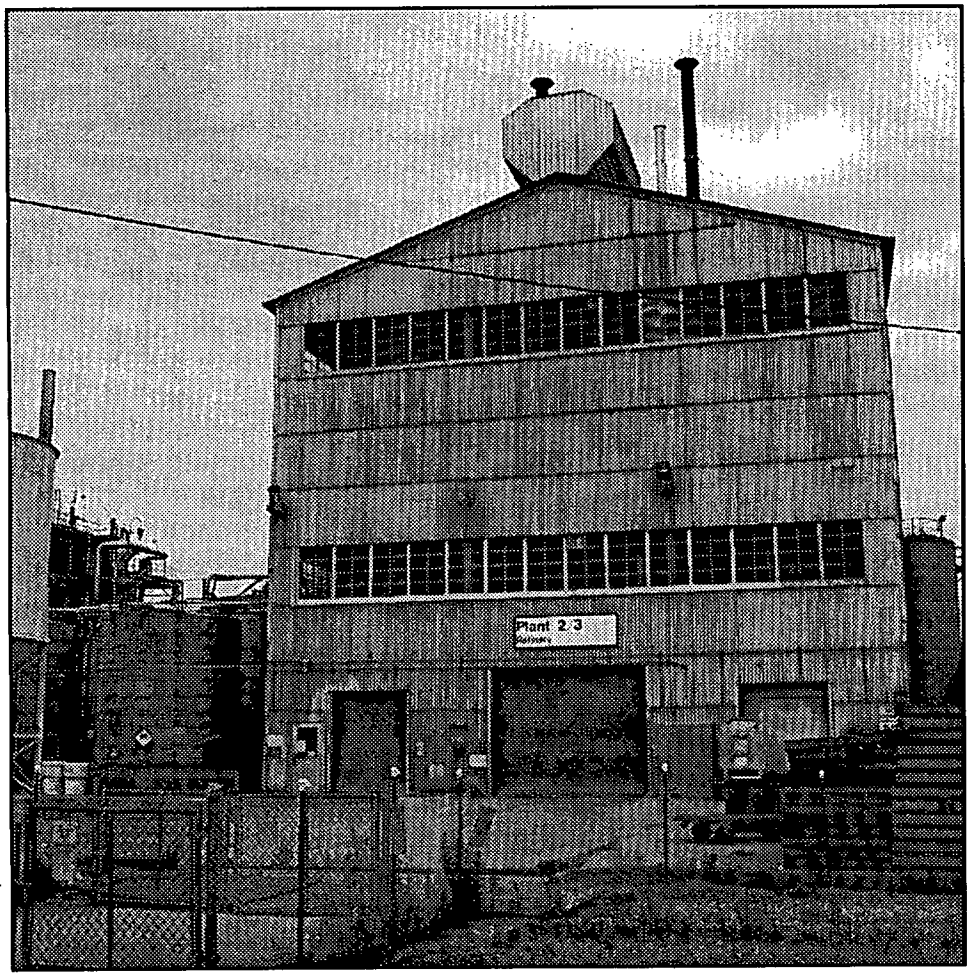
FEMP Neg. No. 6383-D598

18B - GENERAL SUMP

FEMP Neg. No. 6383-D611

FERNALD
Environmental Management Project

2A - ORE REFINERY PLANT

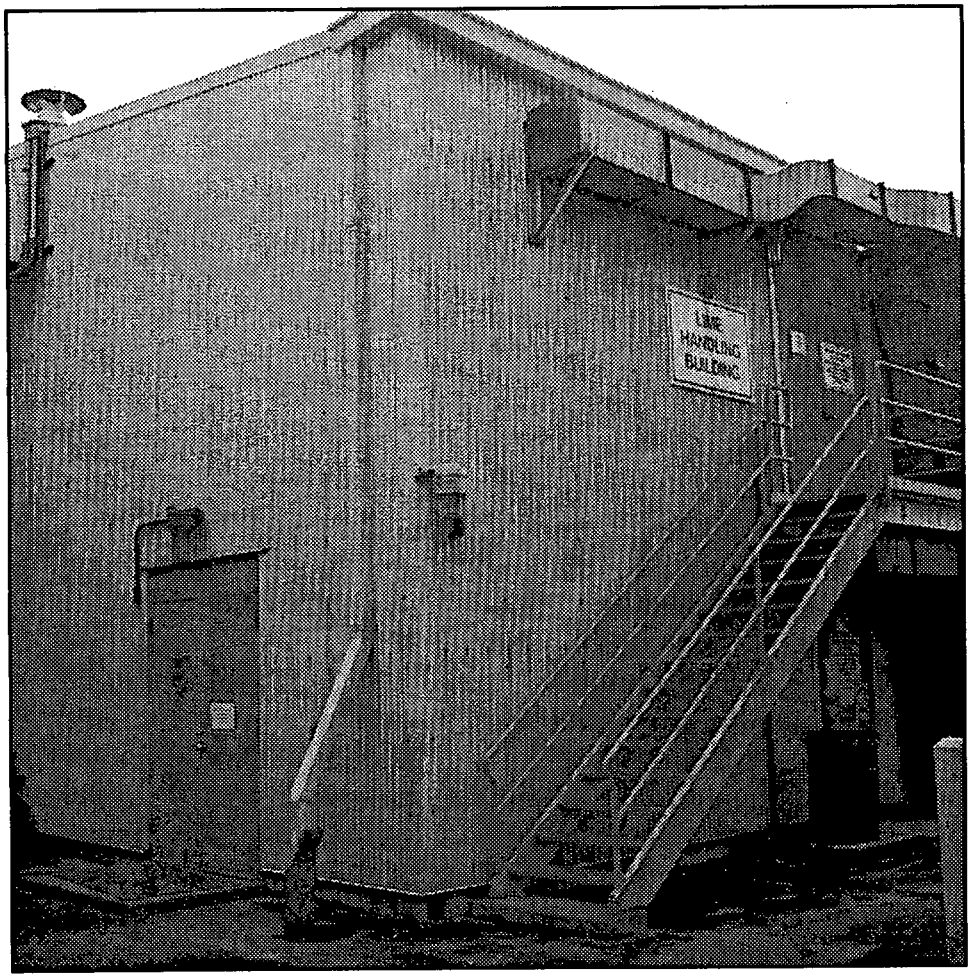


FEMP Neg. No. 7144-D22

FEMP Neg. No. 7144-D23

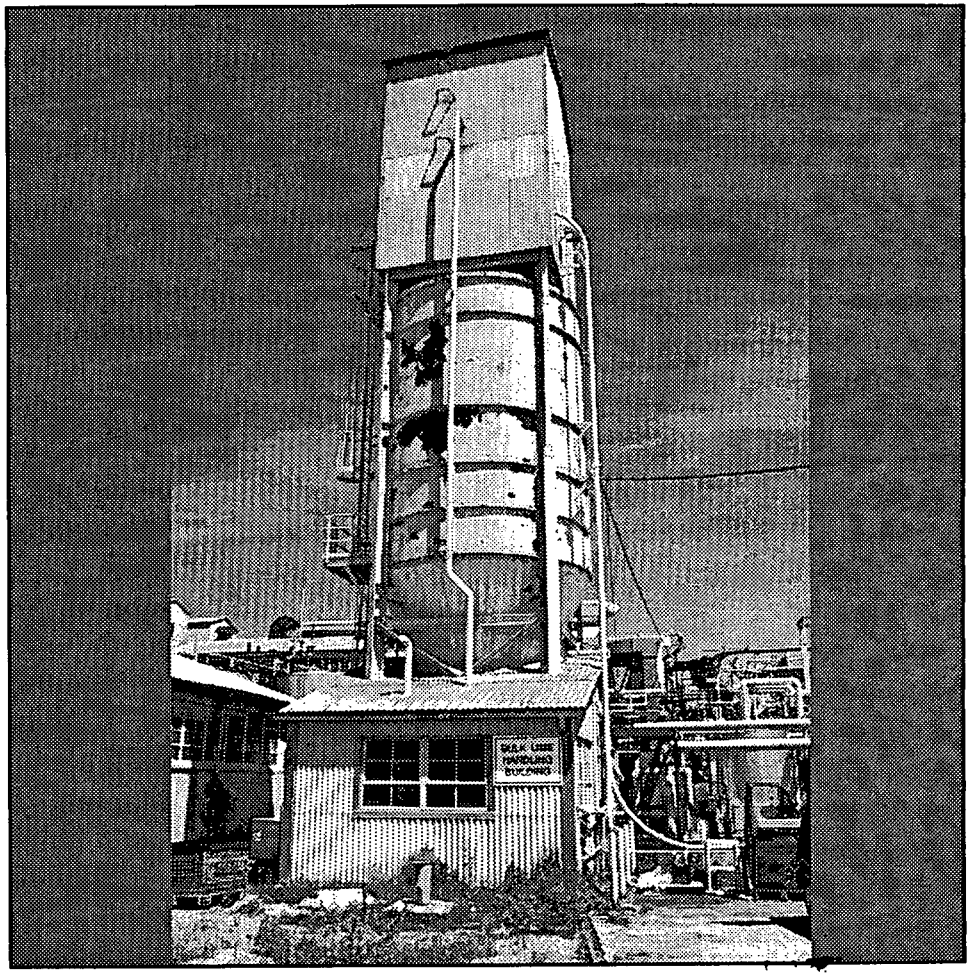
FERNALD
Environmental Management Project

2B - CONTROL BUILDING



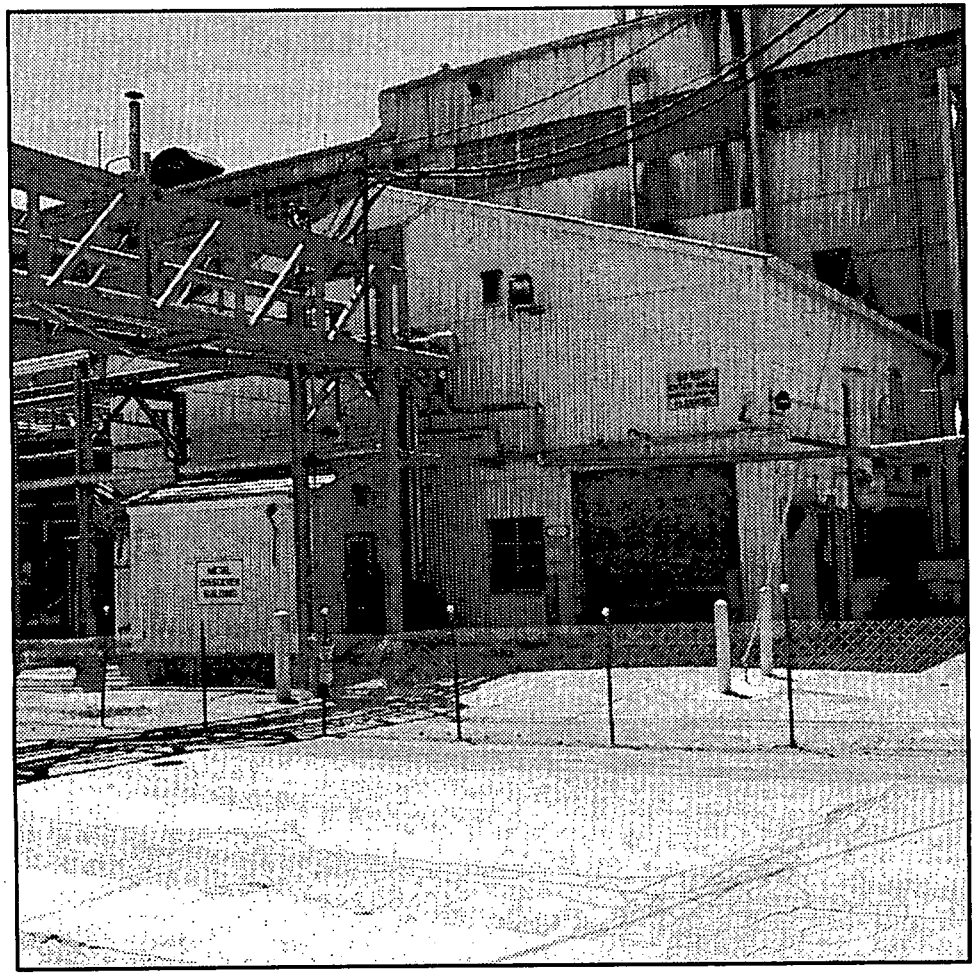
FEMP Neg. No. 7144-D19

2C - BULK LIME HANDLING BLDG



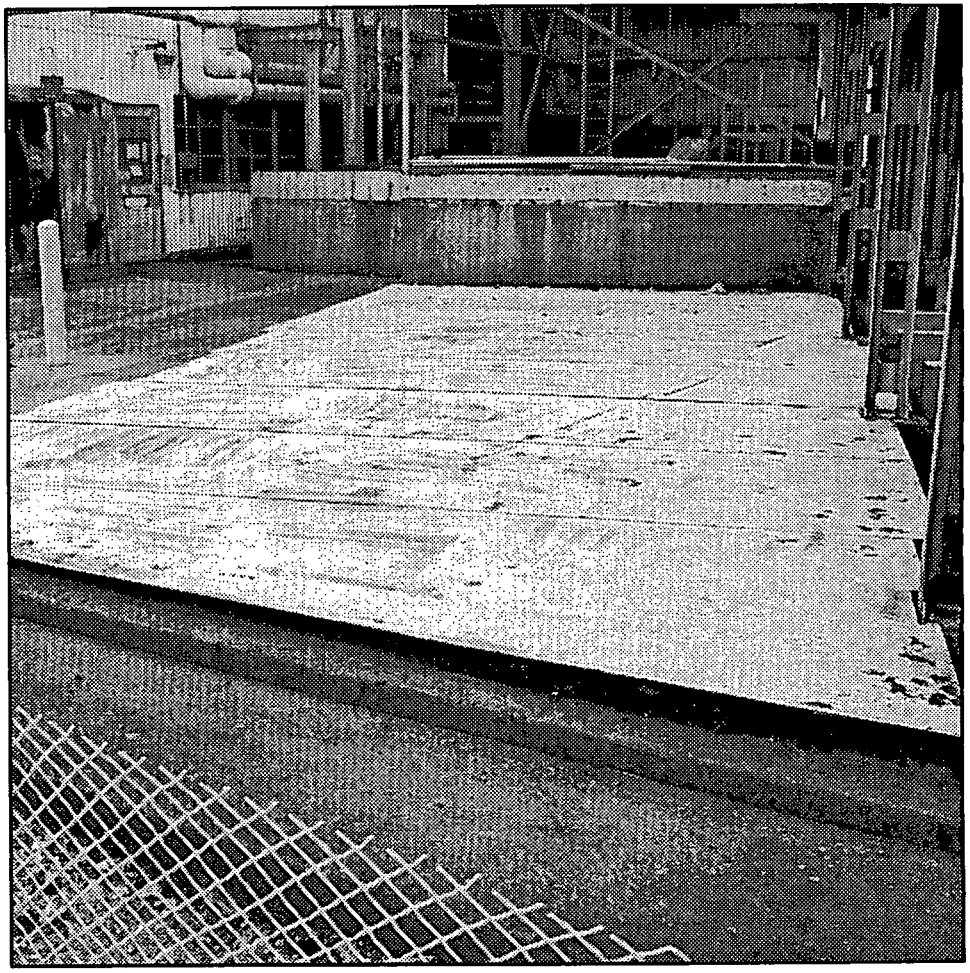
FEMP Neg. No. 7144-D14

2D - METAL DISSOLVER BLDG



FEMP Neg. No. 7144-D15

2H - CONVEYOR TUNNEL



FEMP Neg. No. 7144-D24

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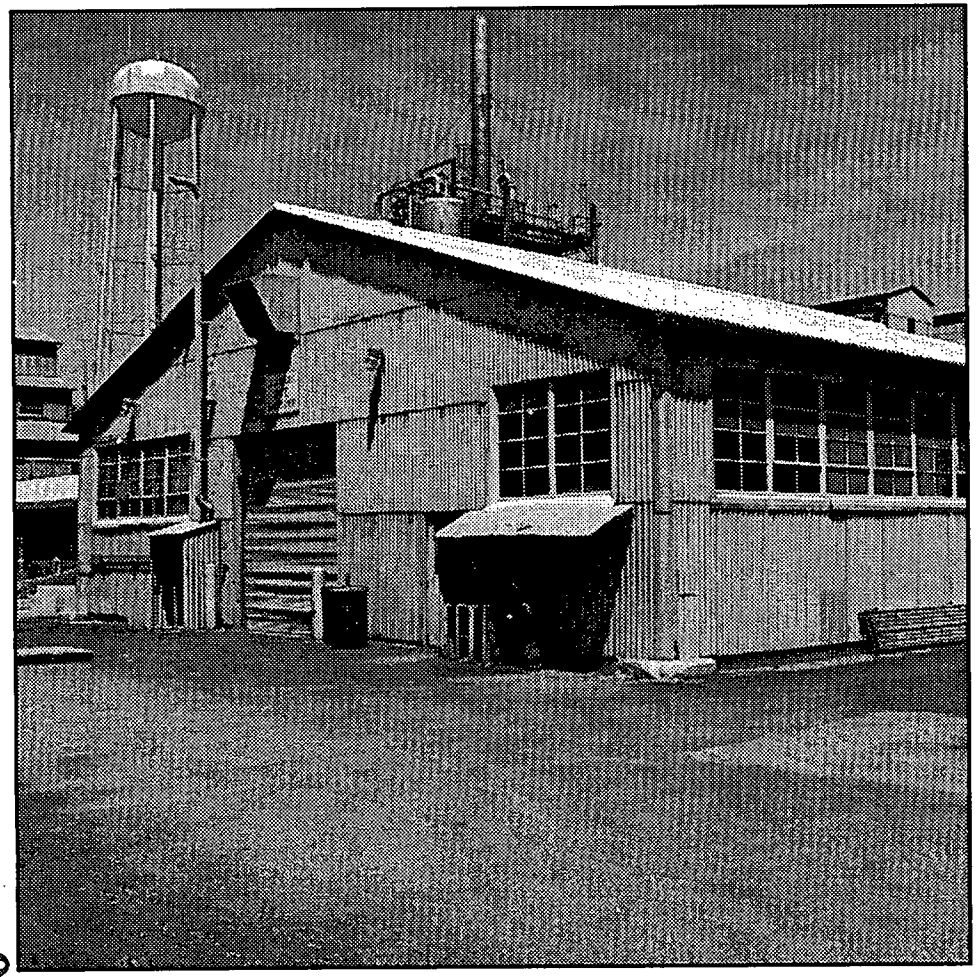
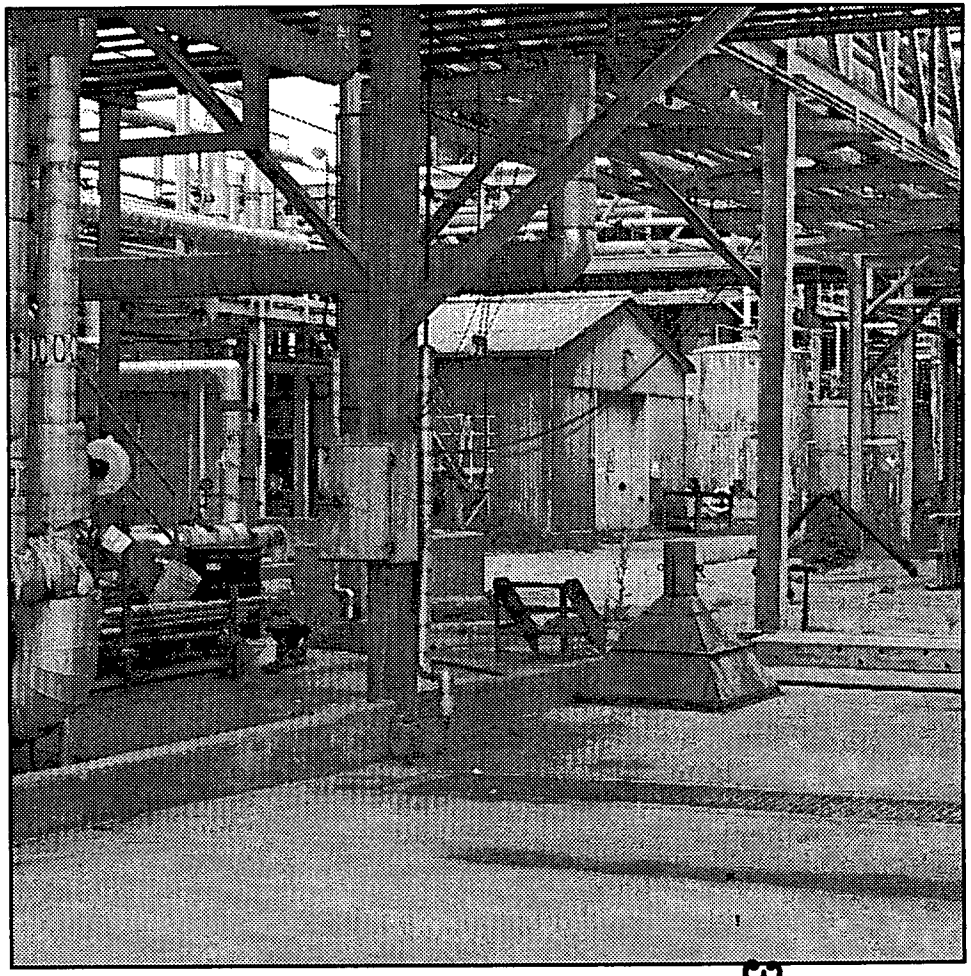
3A - MAINTENANCE BLDG



FEMP Neg. No. 7144-D13

3L - POWER CENTER BLDG



FEMP Neg. No. 7144-D21

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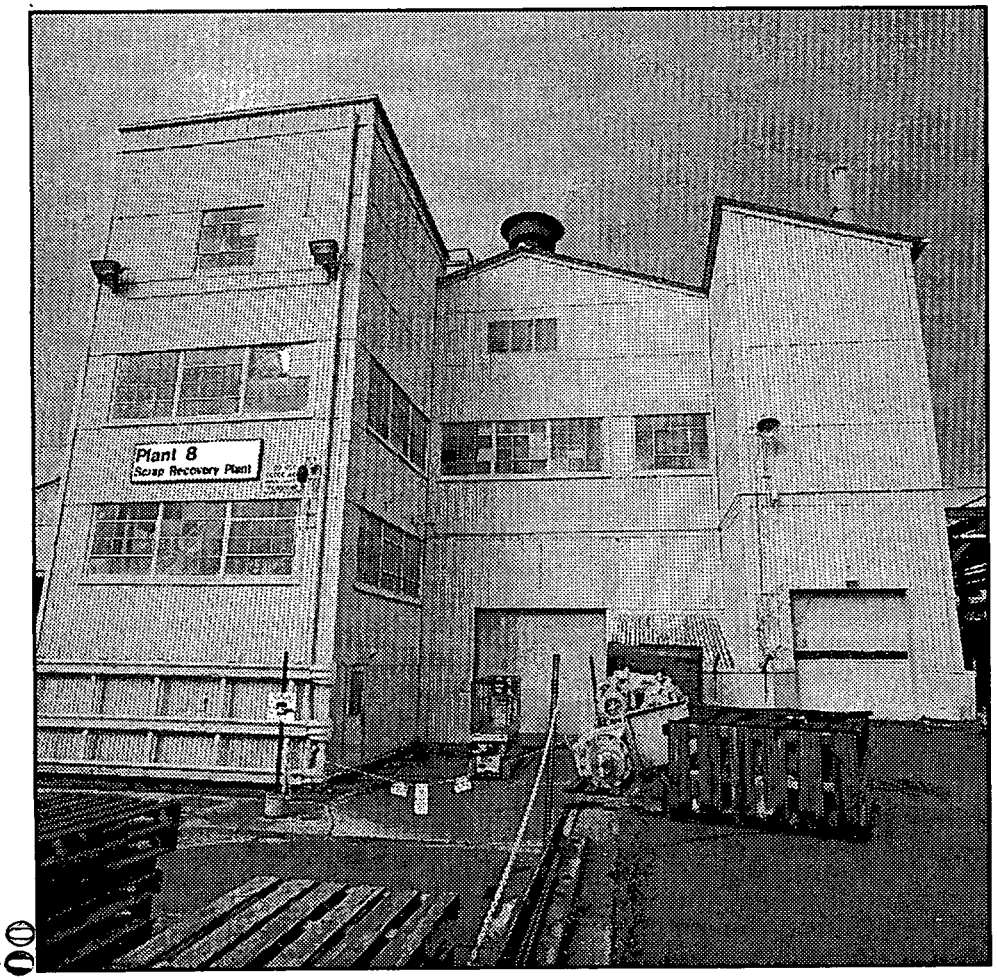
Environmental Management Project

8A - RECOVERY PLANT



FEMP Neg. No. 6681-152

8A, 8C & 8G - PLANT 8

FEMP Neg. No. 6681-161

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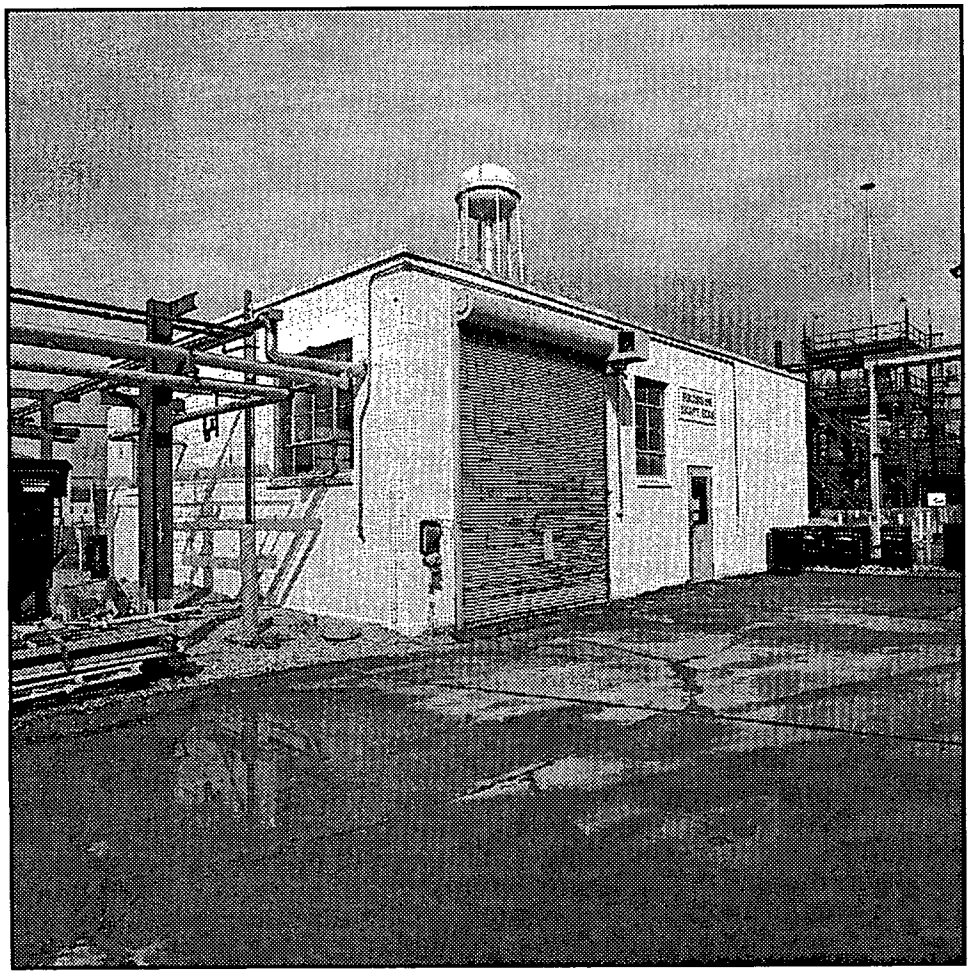
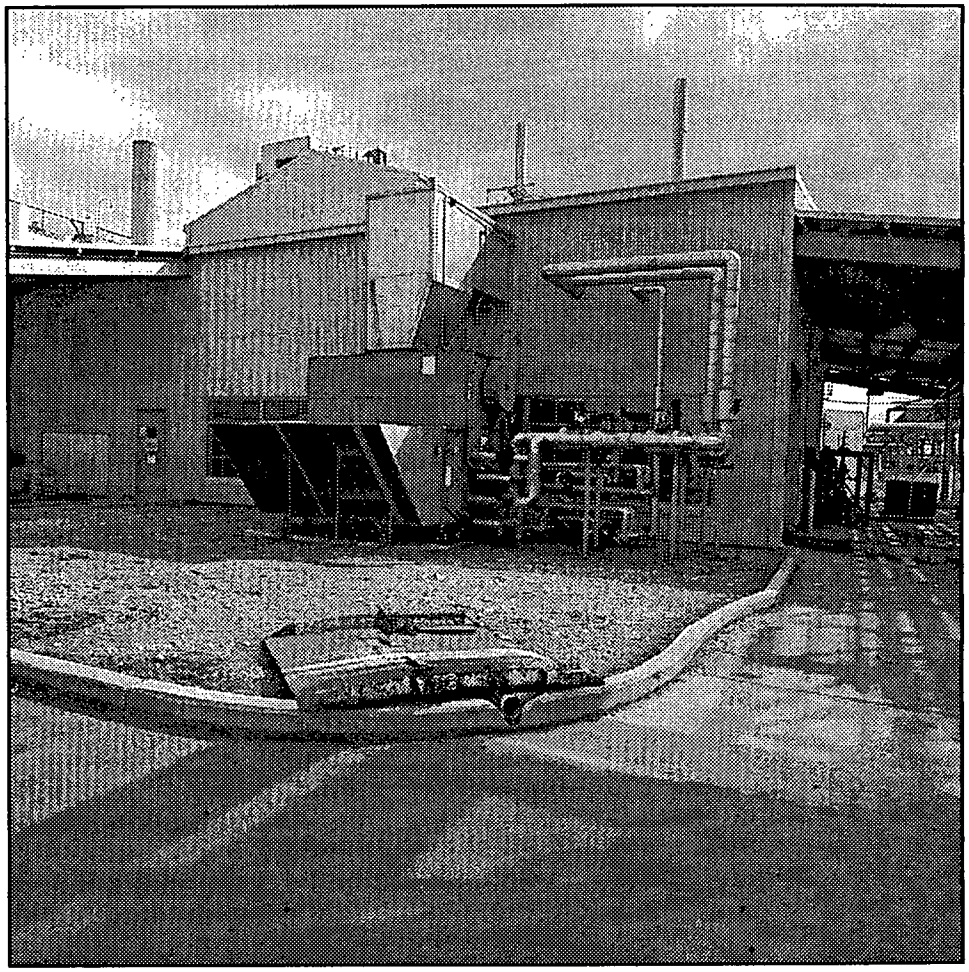
Environmental Management Project

8B - MAINTENANCE BLDG



FEMP Neg. No. 6681-114

8E & 8H - PLANT 8



FEMP Neg. No. 6681-110

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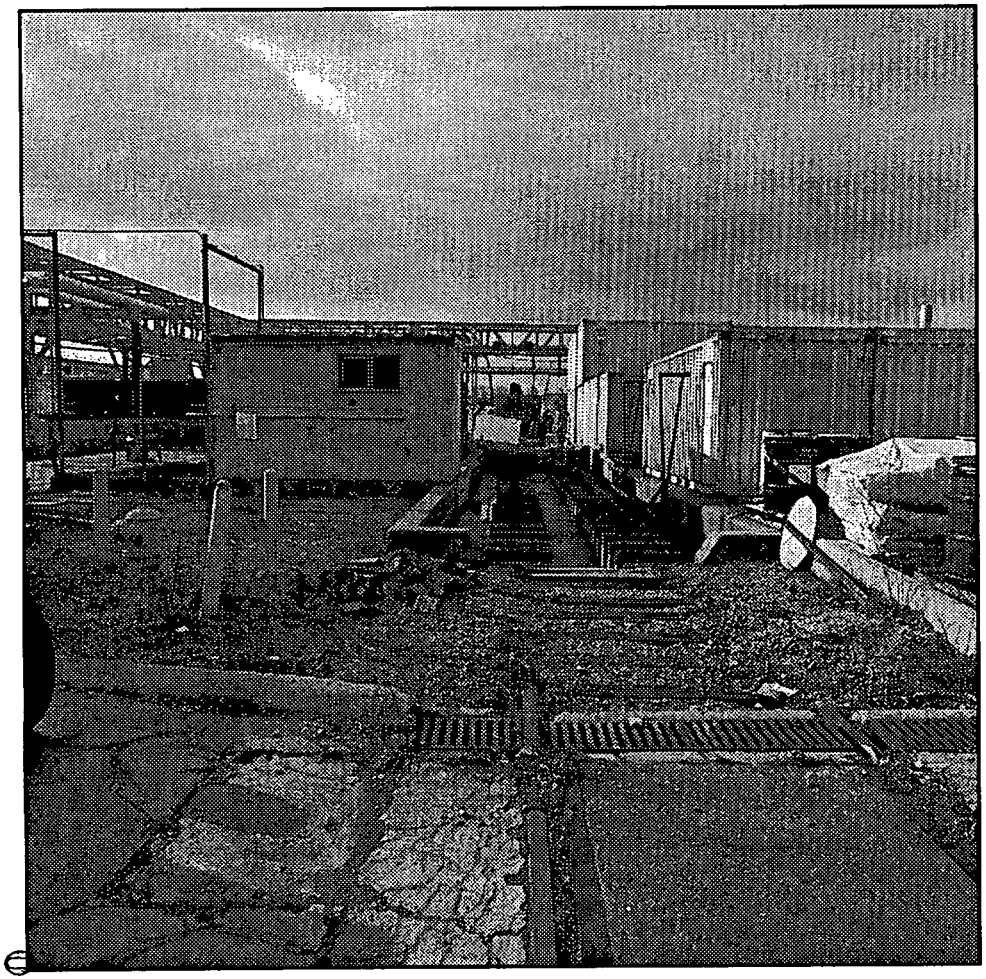
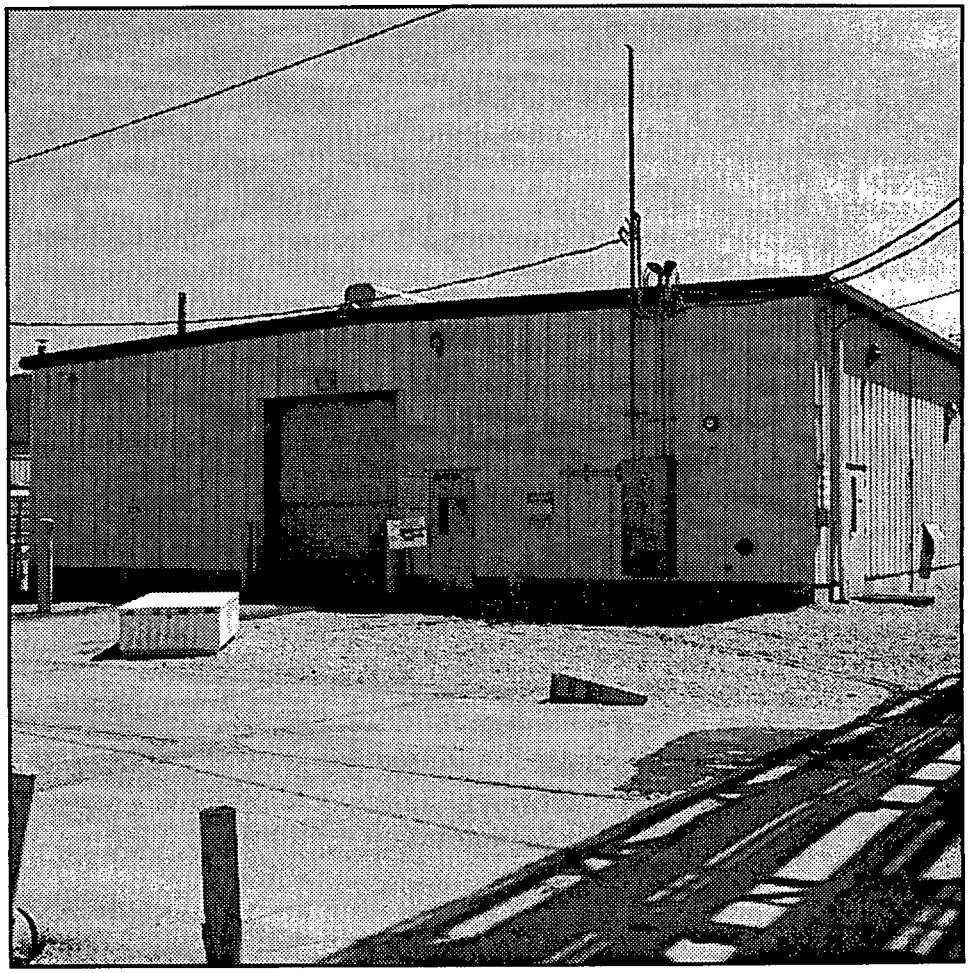
8D - RAILROAD FILTER BLDG



FEMP Neg. No. 6681-154

8O - PLANT 8 WAREHOUSE



FEMP Neg. No. 7144-D5

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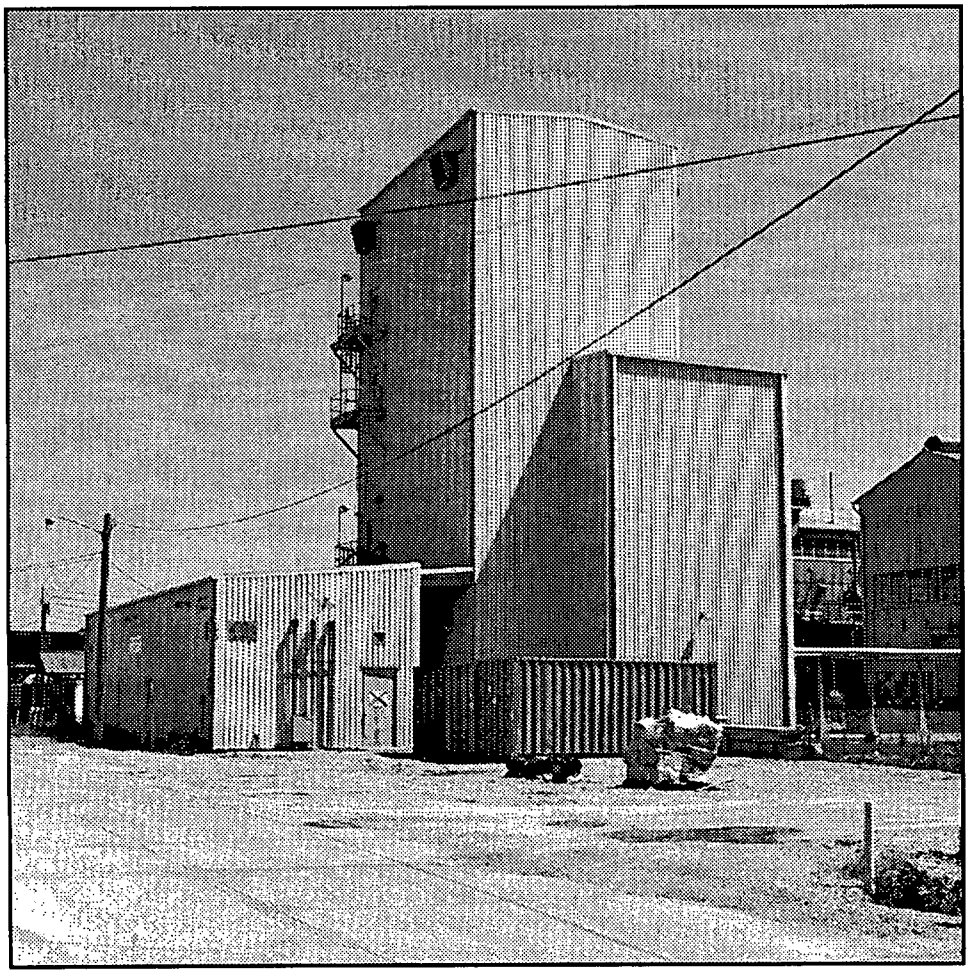
18D - BIO TOWERS



FEMP Neg. No. 7144-D8

18H - BND FACILITY

FEMP Neg. No. 7144-D7

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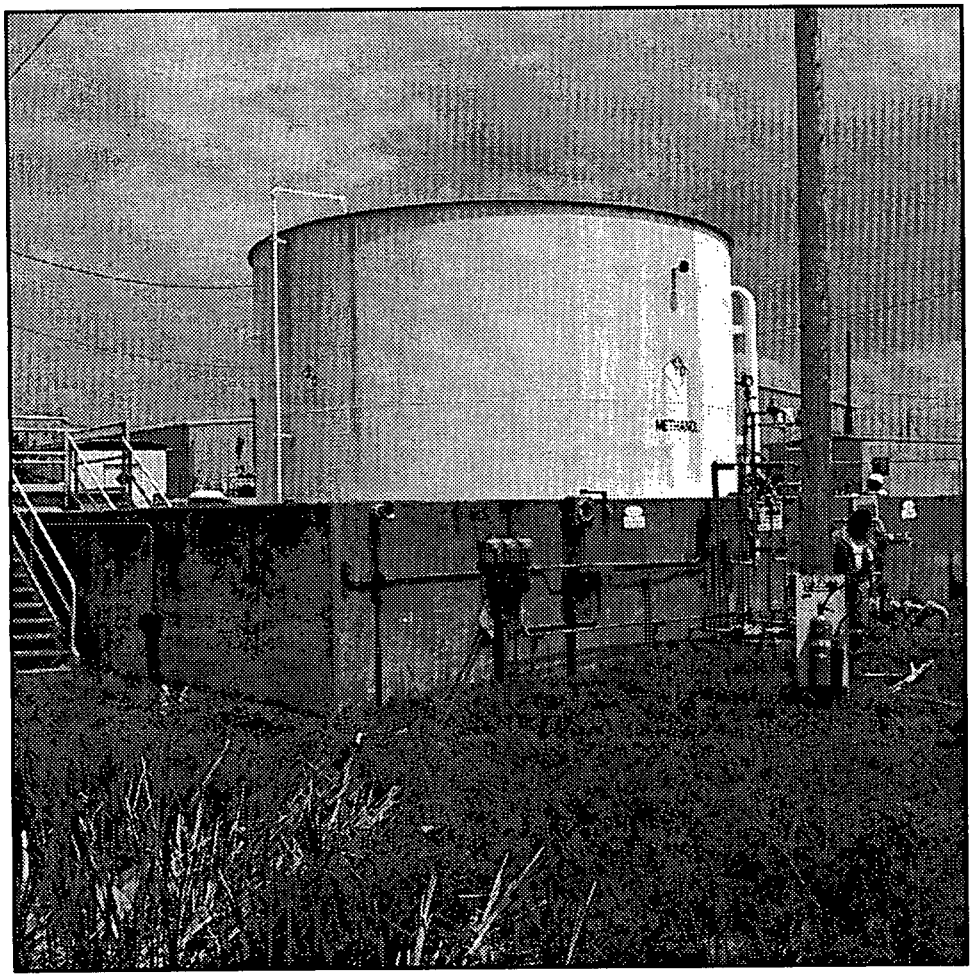
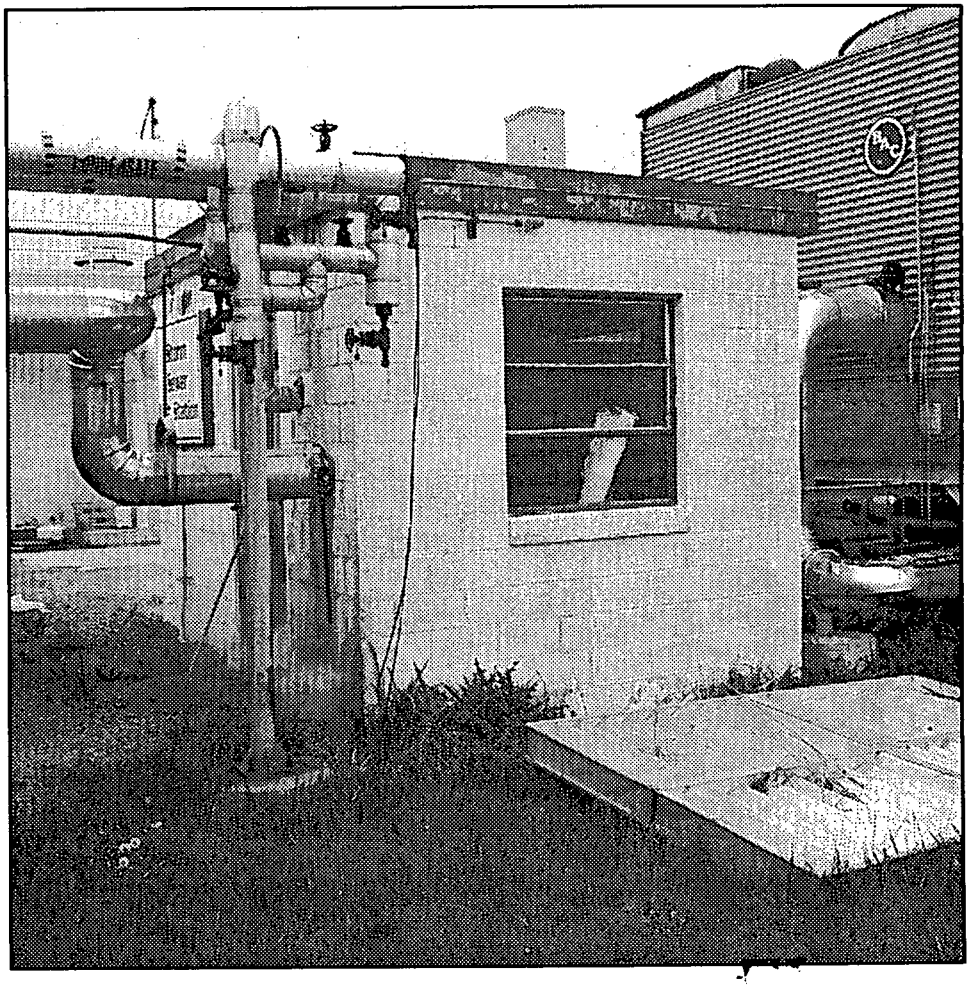
Environmental Management Project

18J - METHANOL TANK



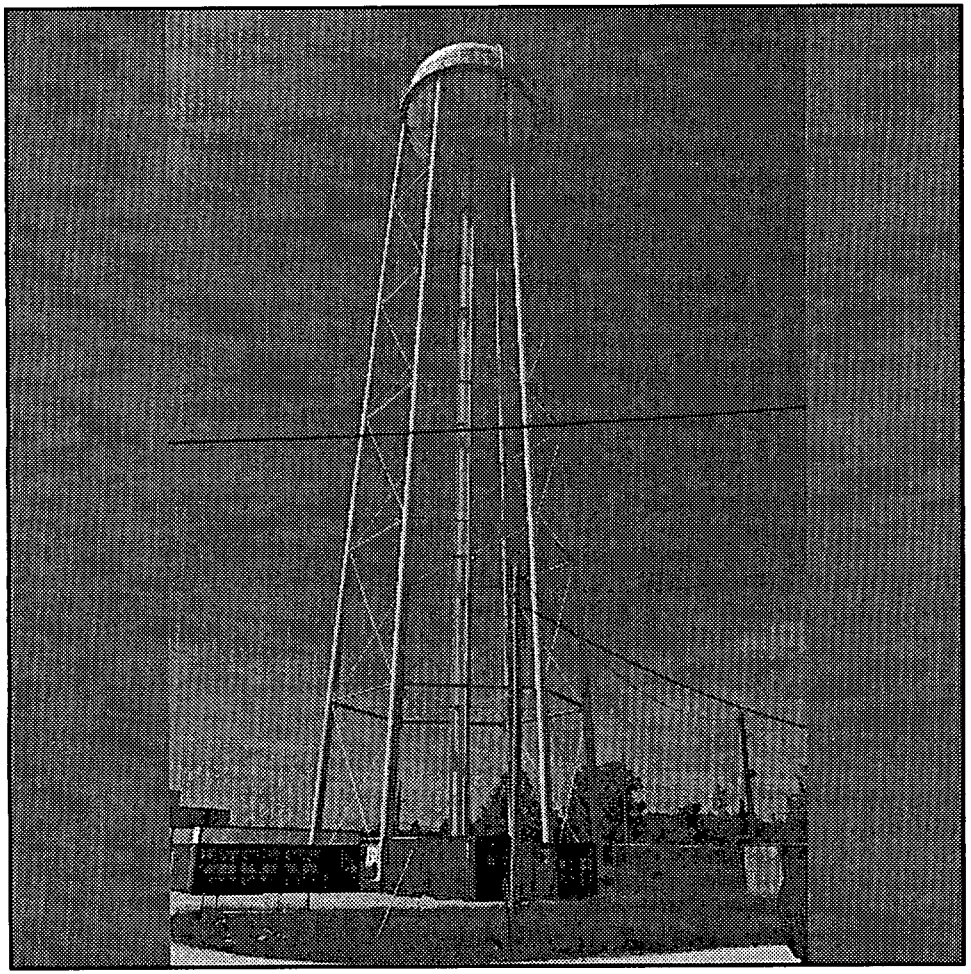
FEMP Neg. No. 7125-D4

22B - SS LIFT STATION



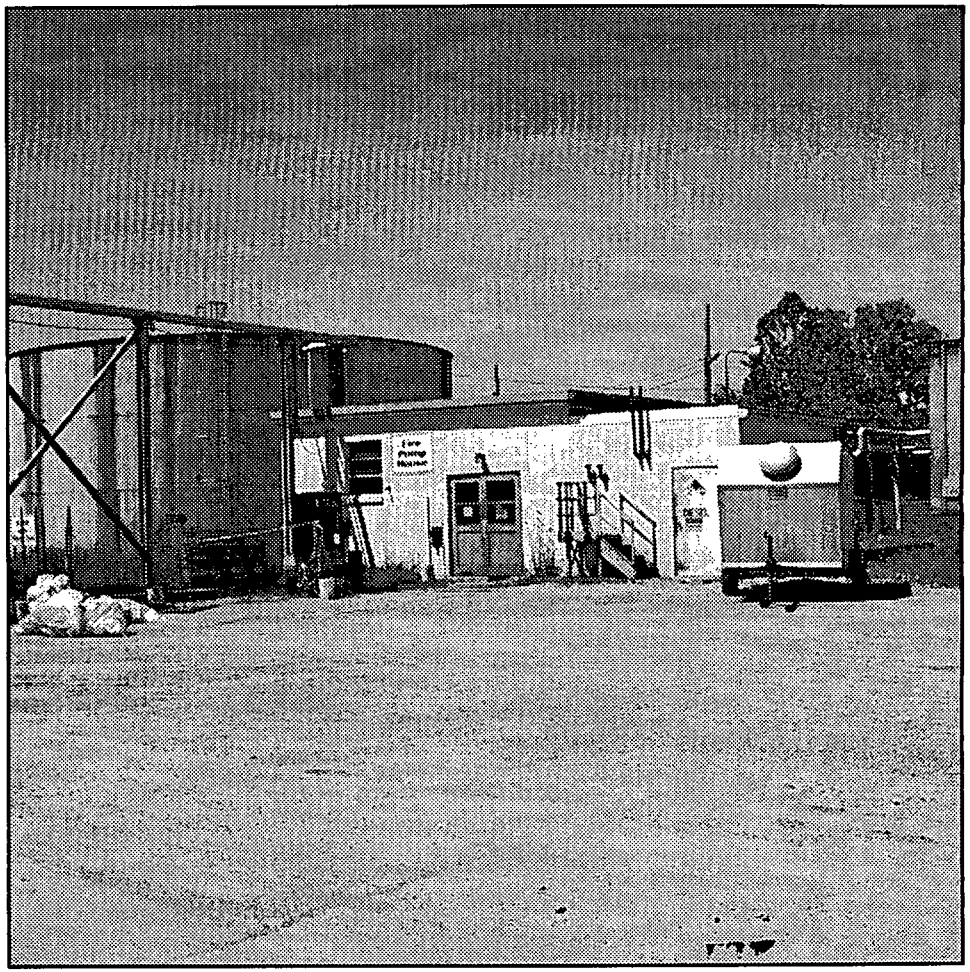
FEMP Neg. No. 7349-D1

26B - WATER STORAGE TANK



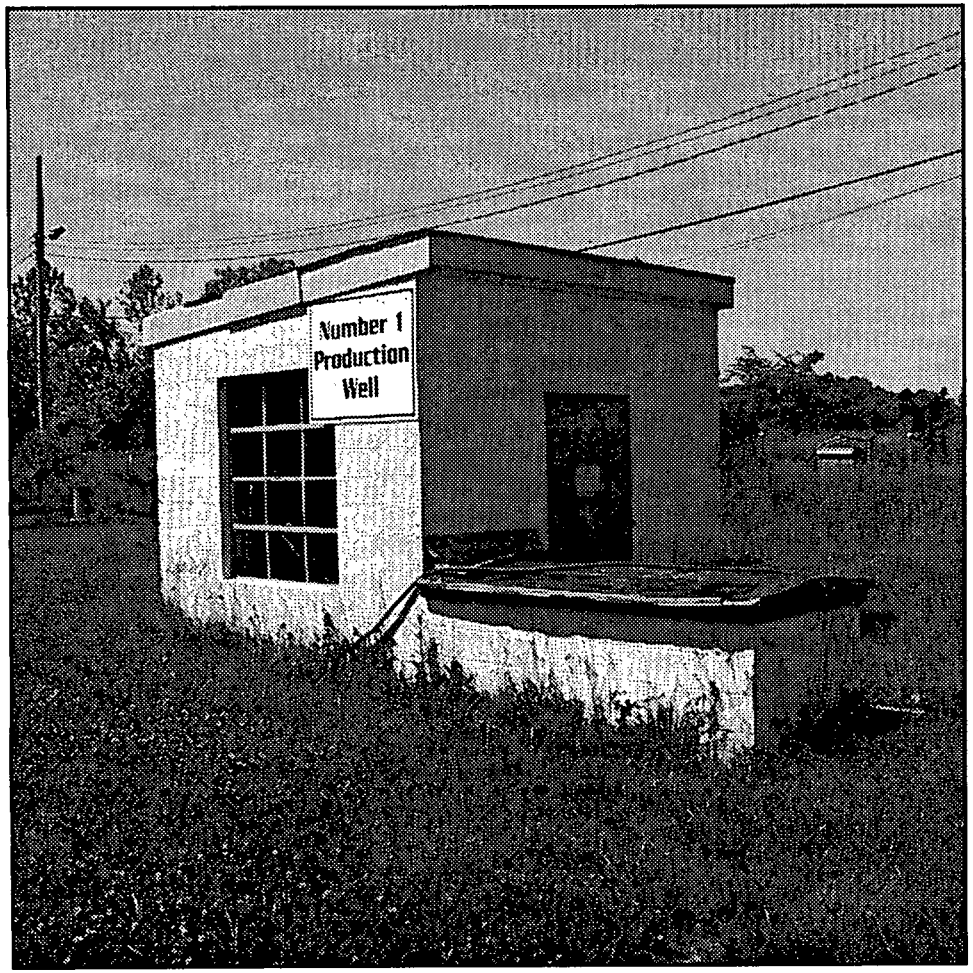
FEMP Neg. No. 7144-D10

26A - PUMP HOUSE



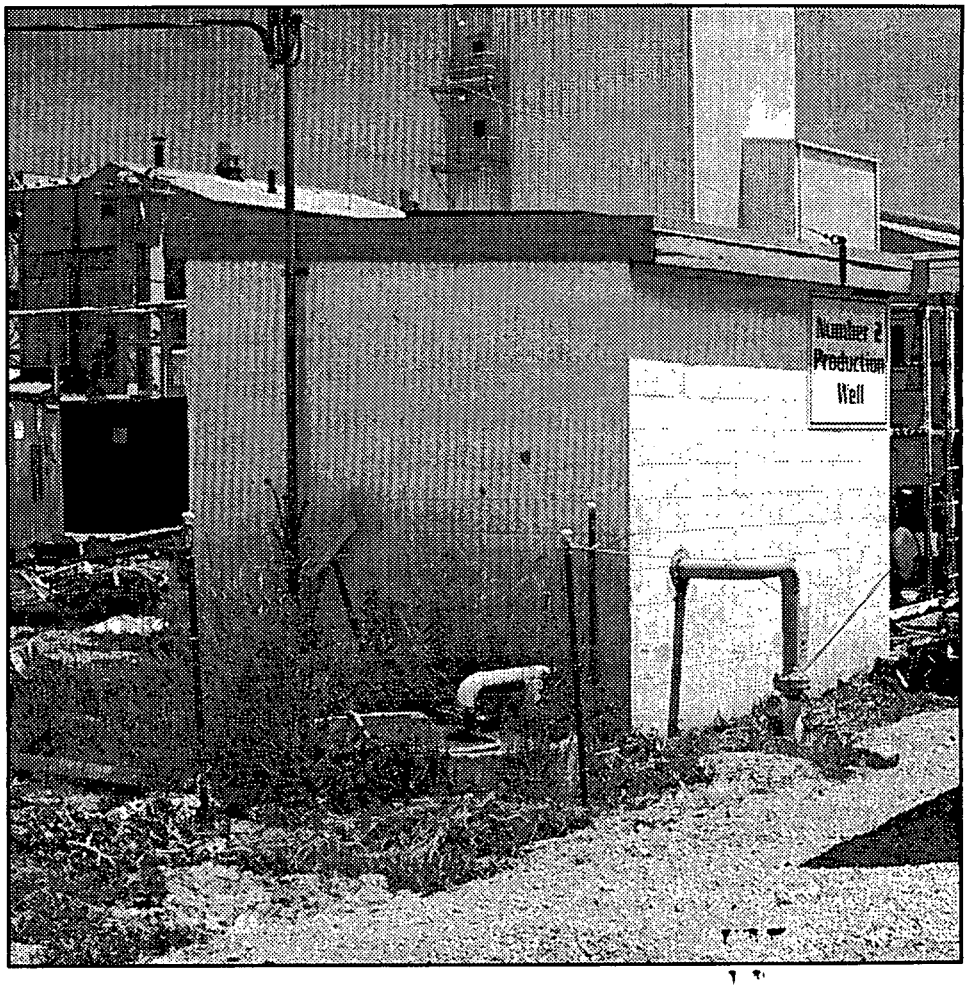
FEMP Neg. No. 7144-D9

20E - WELL HOUSE #1



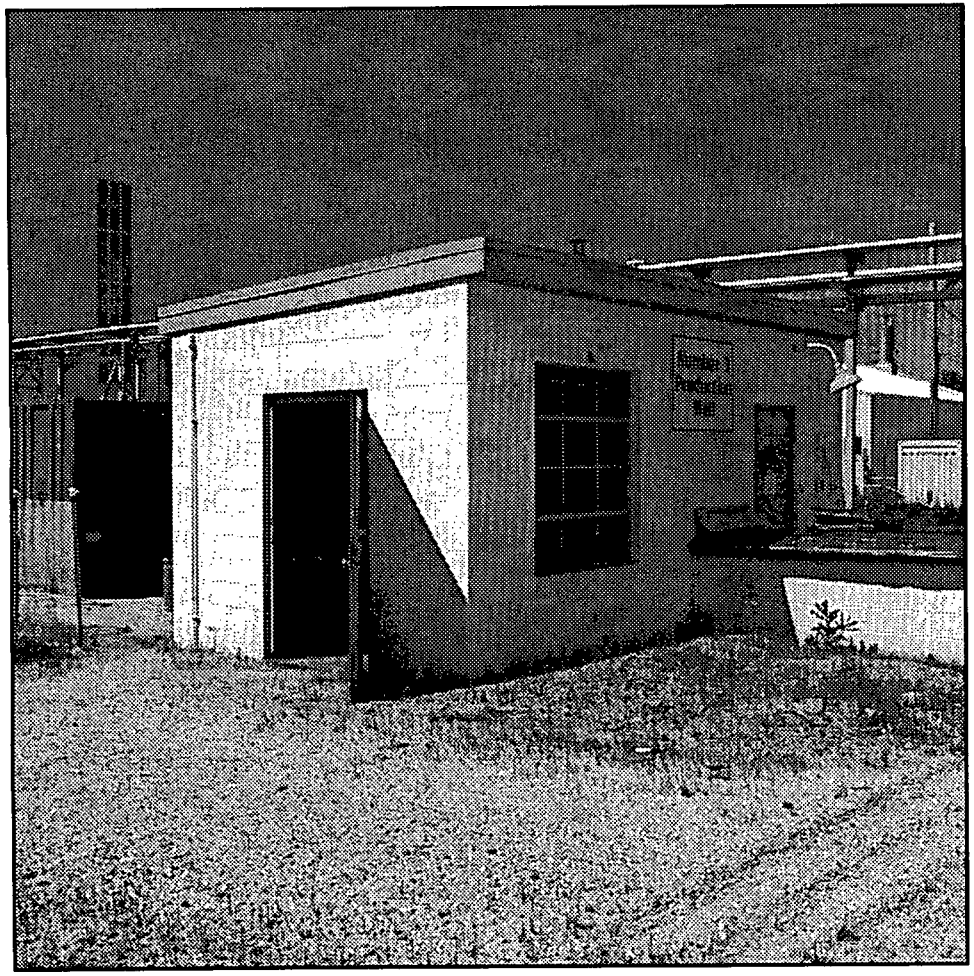
FEMP Neg. No. 7144-D11

20F - WELL HOUSE #2



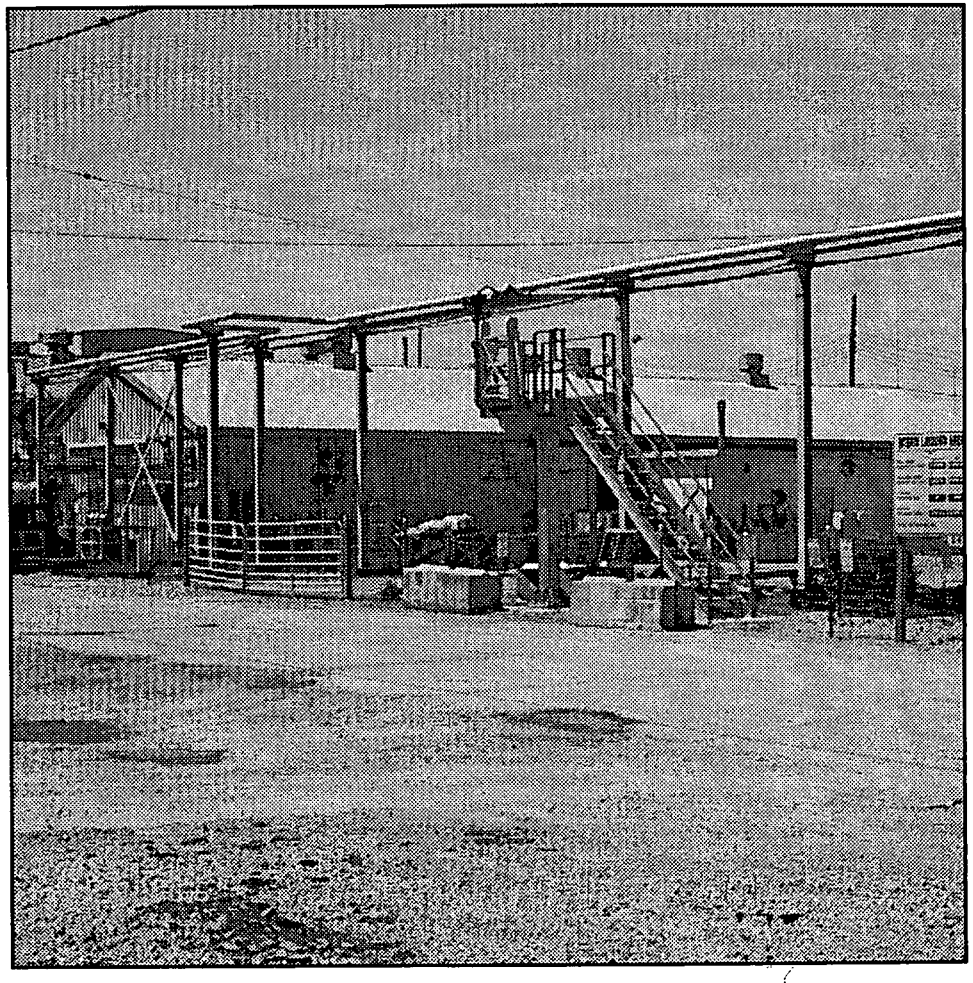
FEMP Neg. No. 7144-D17

20G - WELL HOUSE #3



FEMP Neg. No. 7144-D6

45A - MAINT. SHOP BLDG



FEMP Neg. No. 7144-D12

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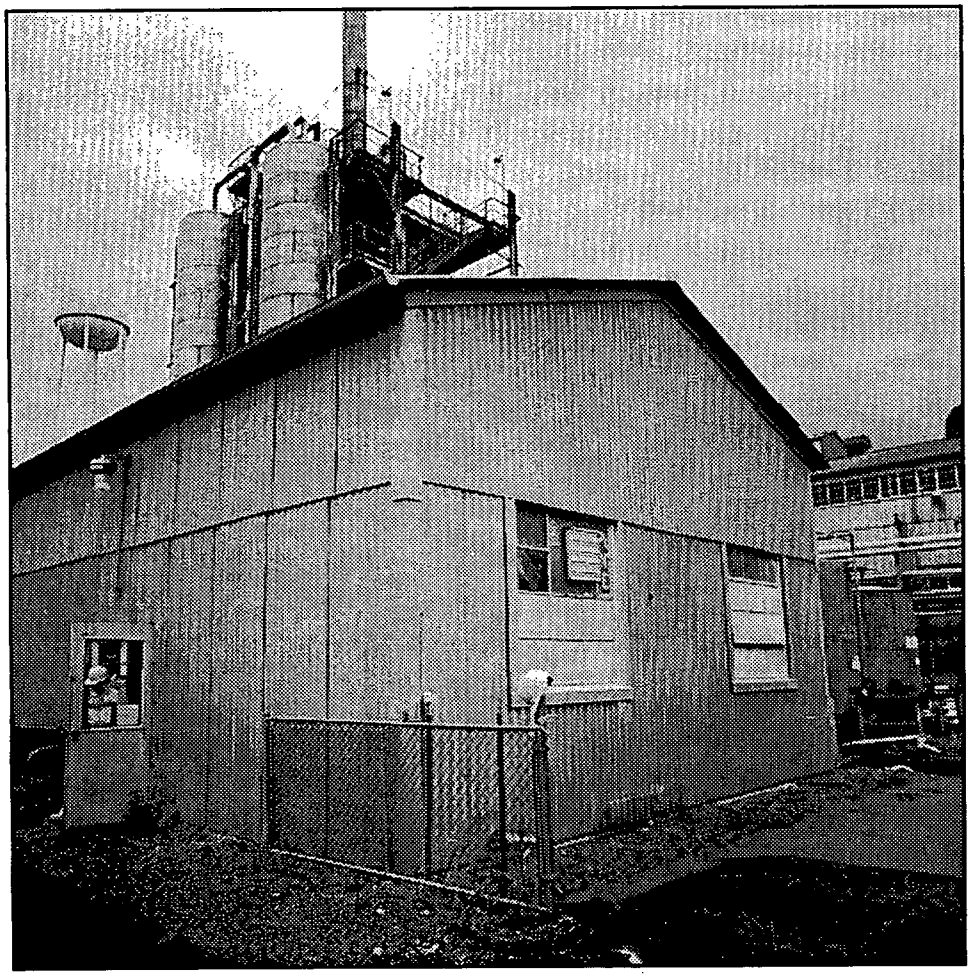
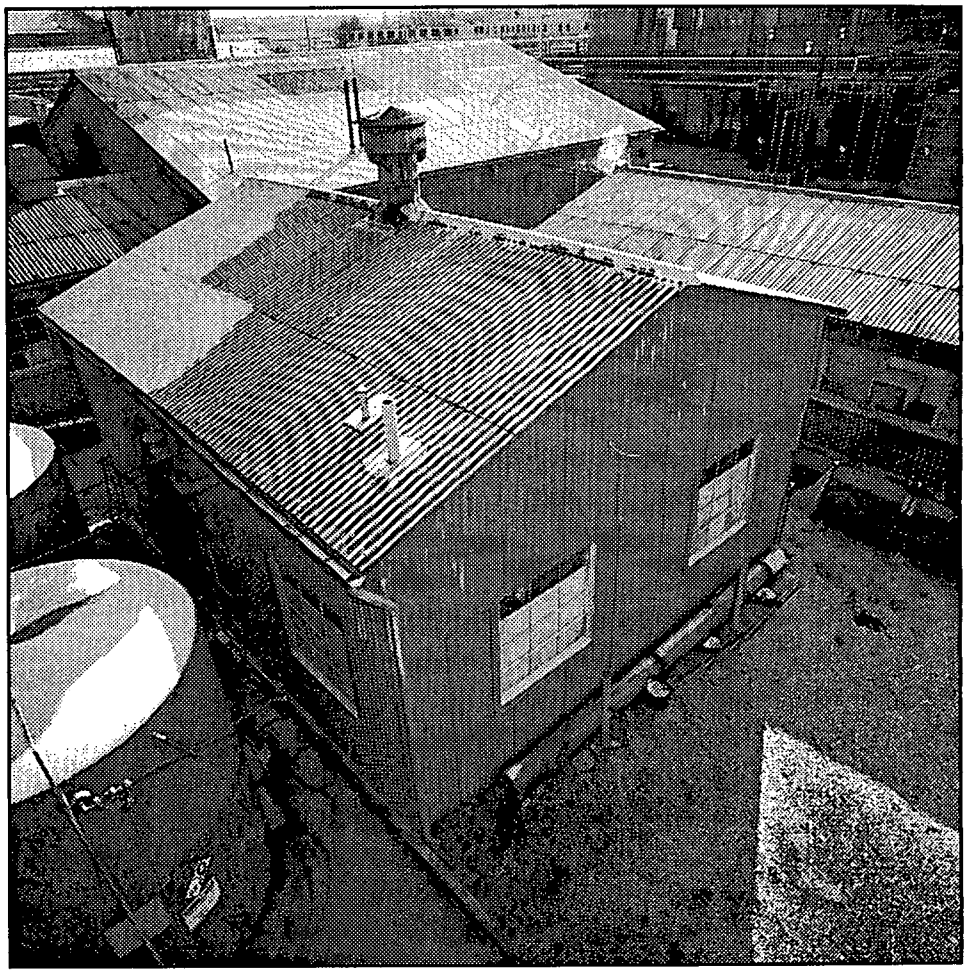
PLANT 3 - 3B OZONE BUILDING



FEMP Neg. No. 6767-28



FEMP Neg. No. 6502-53

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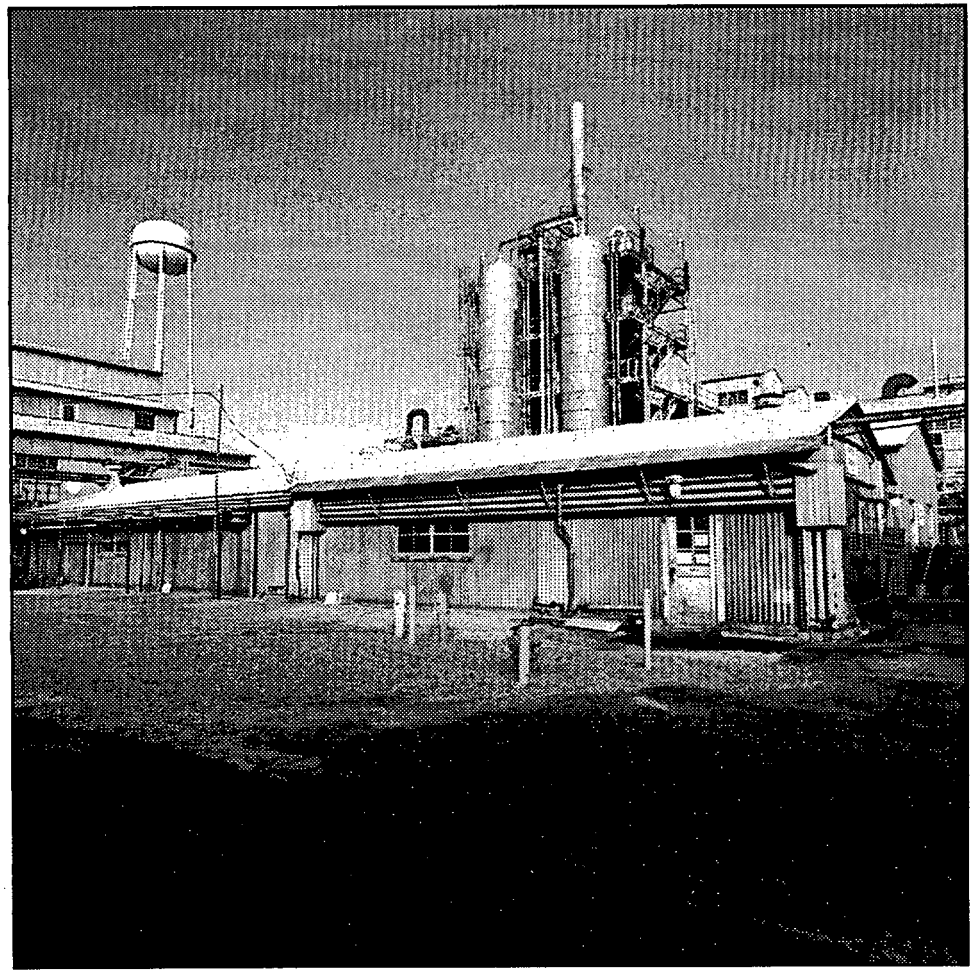
PLANT 3 - 3C NAR CONTROL BUILDING



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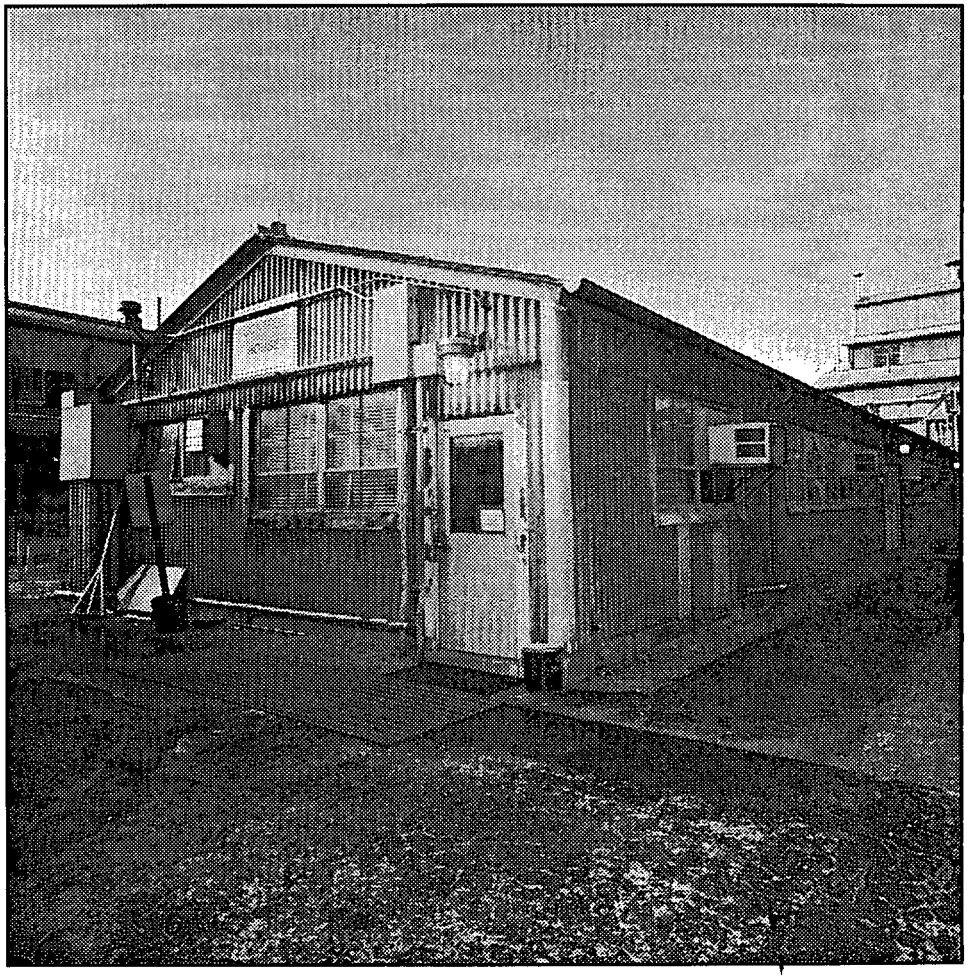

FEMP Neg. No. 6502-26

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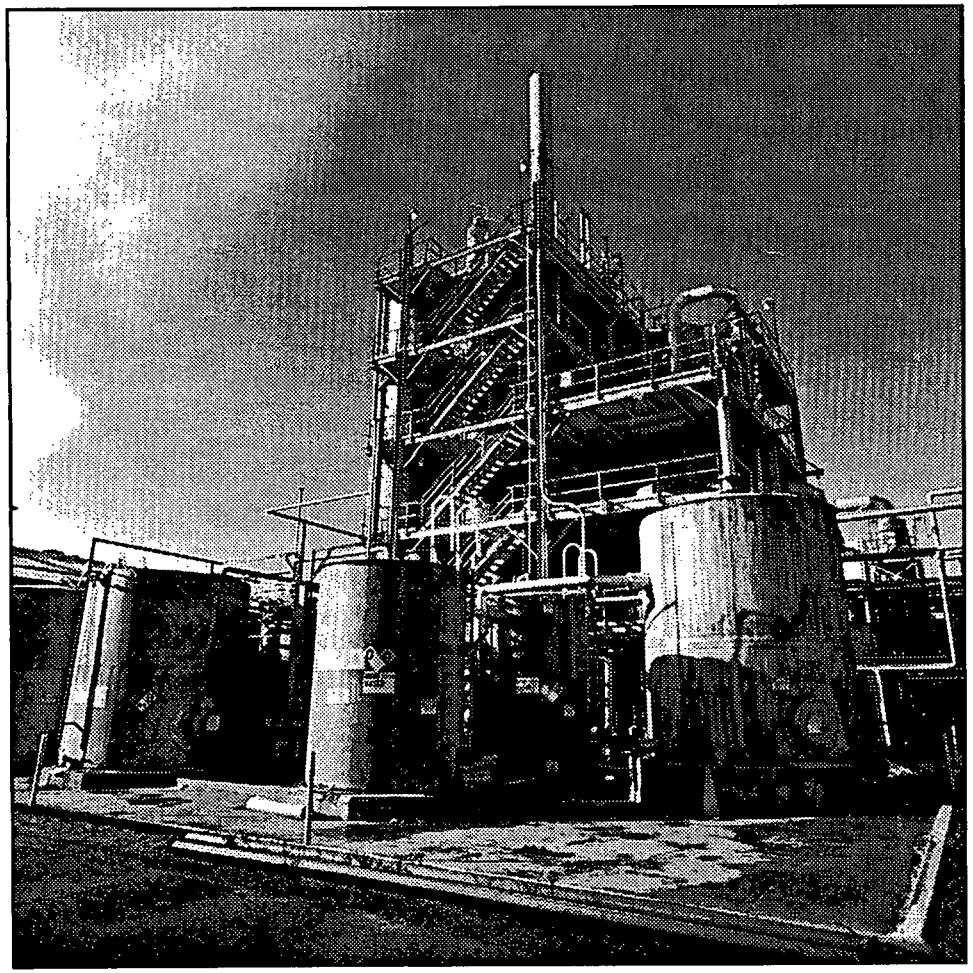
PLANT 3 - 3D NAR TOWERS AND TANKS - EAST PAD



FEMP Neg. No. 6502-28

FEMP Neg. No. 6502-32

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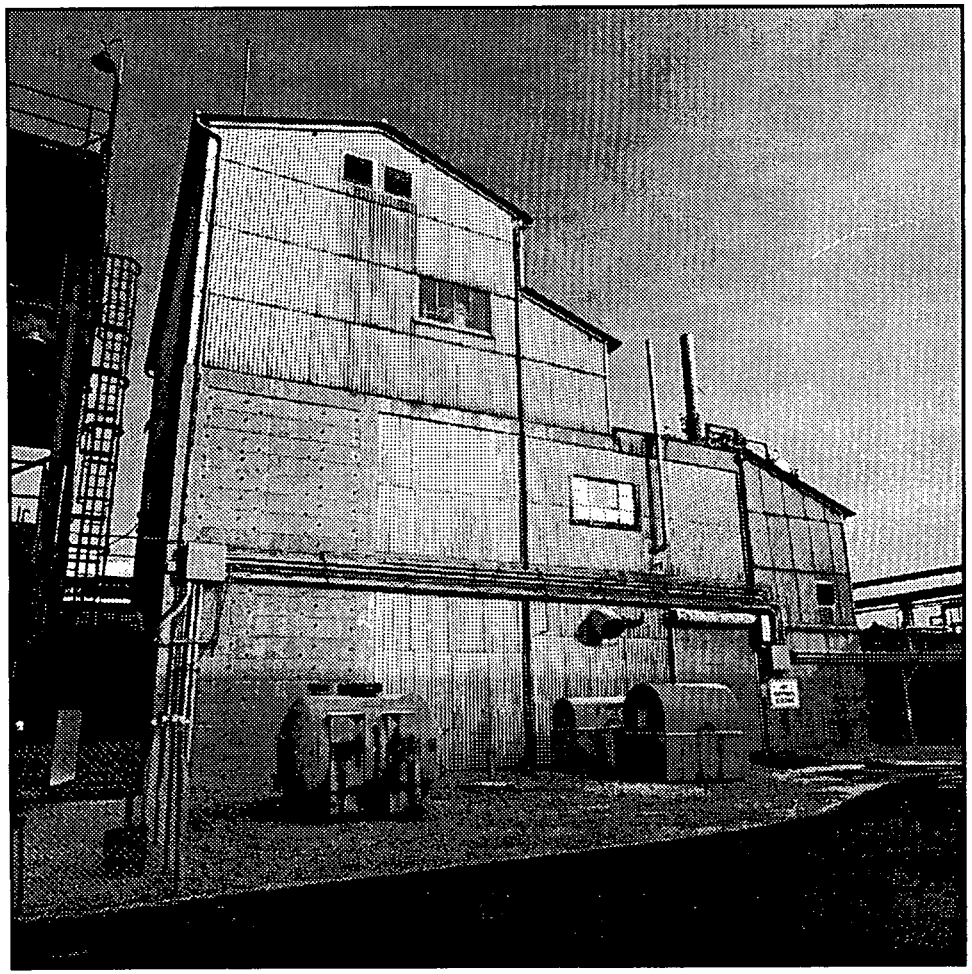
PLANT 3 - 3E HOT RAFFINATE BUILDING



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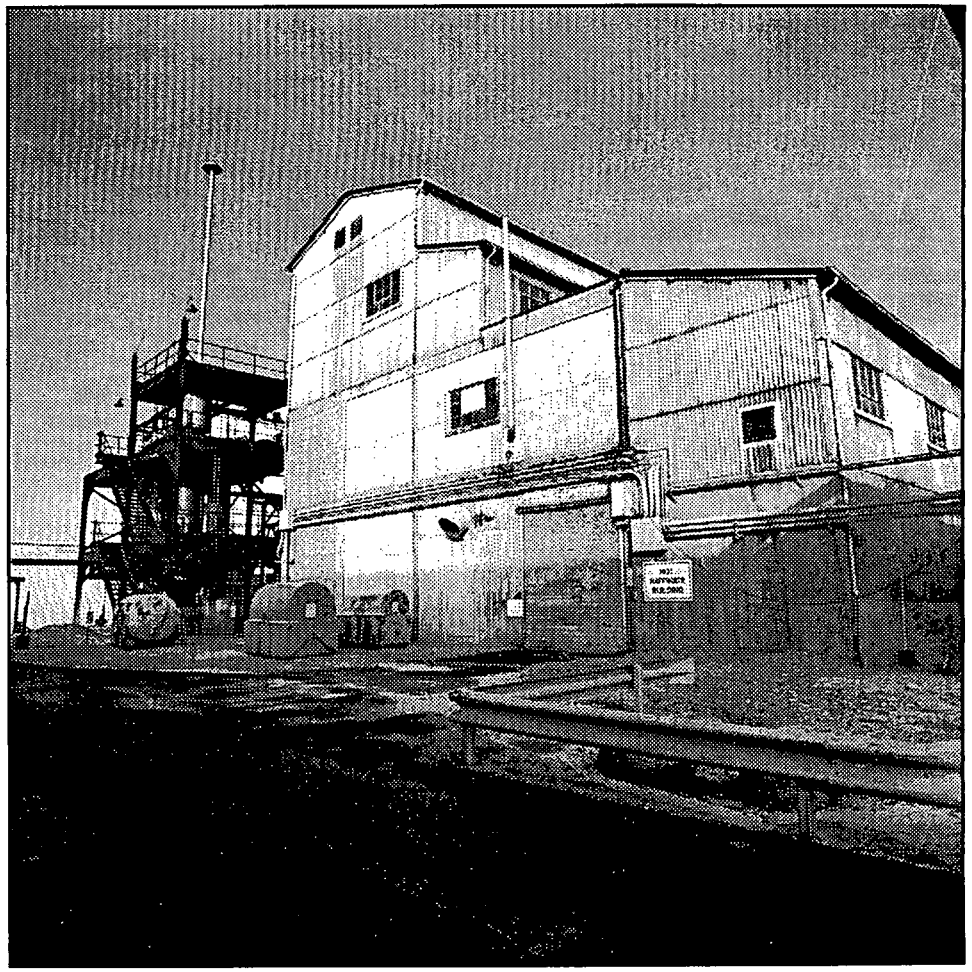

FEMP Neg. No. 6502-23

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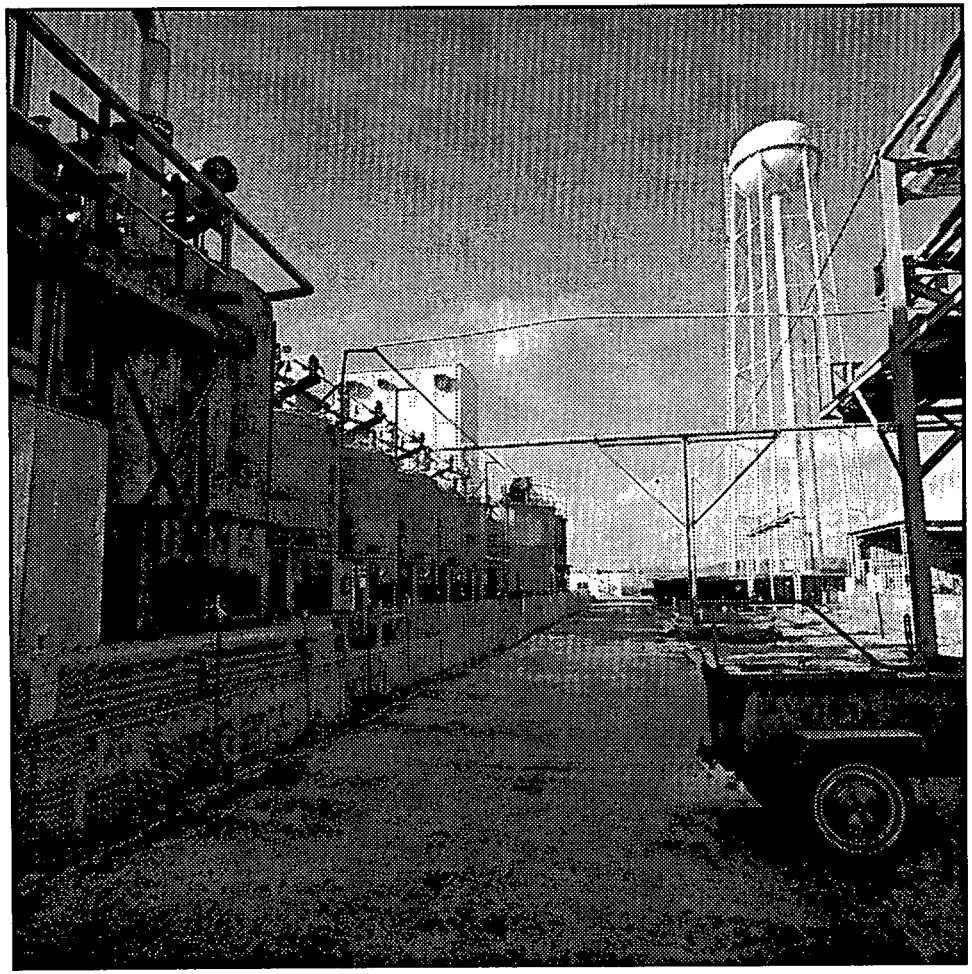
PLANT 3 - 3J COMBINED RAFFINATE TANKS



FEMP Neg. No. 6502-43

FEMP Neg. No. 6502-60

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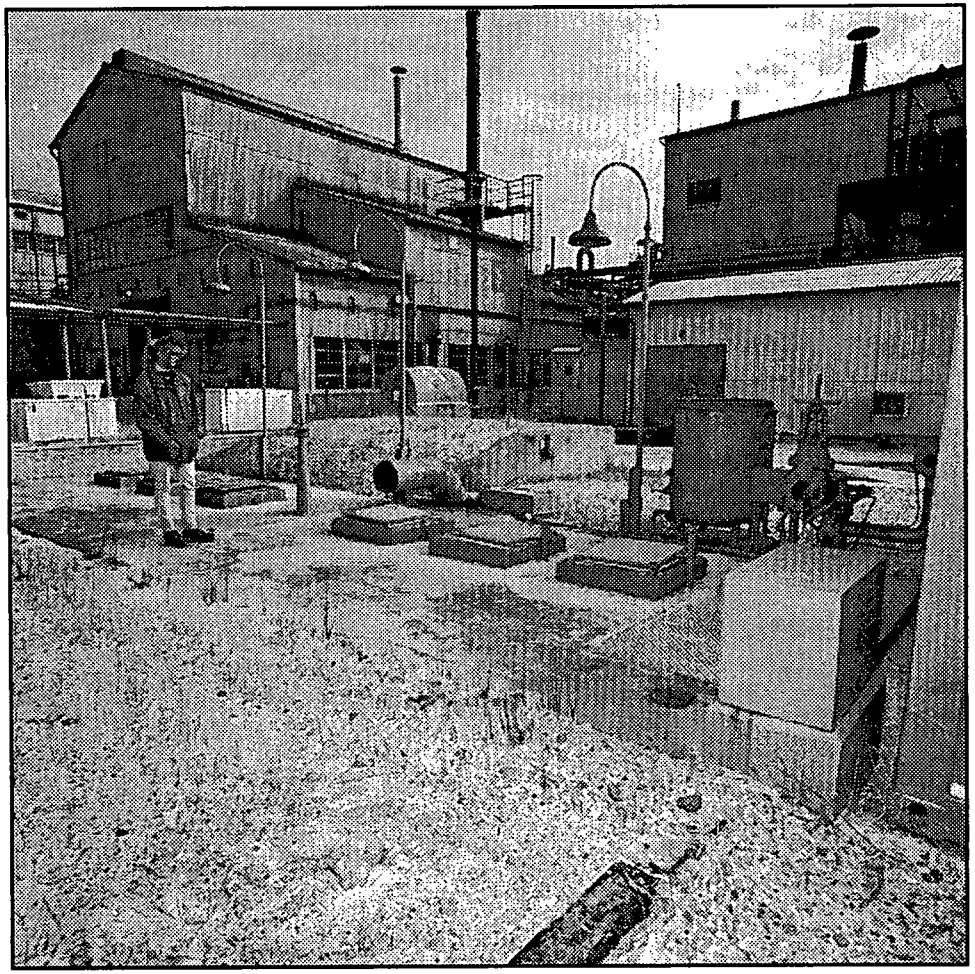
Environmental Management Project

PLANT 3 - 3K OLD COOLING WATER TOWER



FEMP Neg. No. 6502-16

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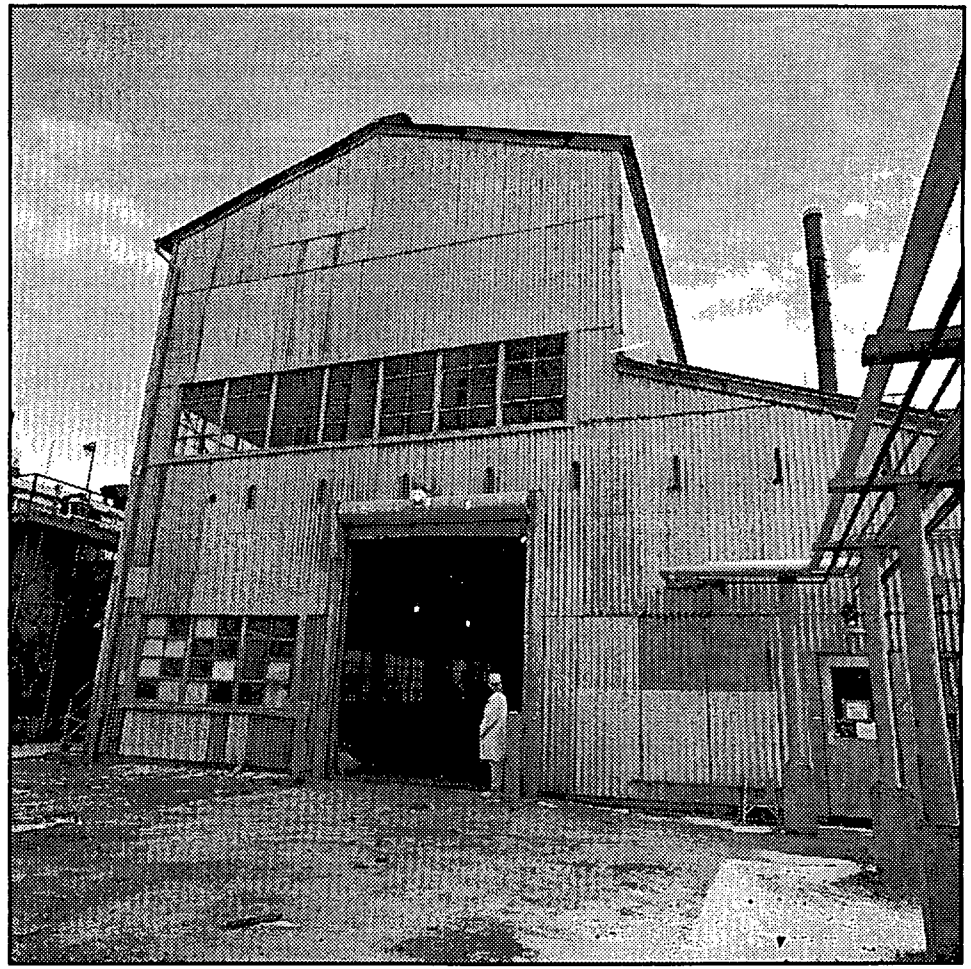
PLANT 3 - 39 A INCINERATOR BUILDING

FEMP Neg. No. 6502-71



FEMP Neg. No. 6502-70

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